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ERGONOMIC ASSESSMENT OF INFORMATION AND COMMUNICATION SYSTEMS FOR TRAVELLERS WITH DISABILITIES

Prepared for the

Transportation Development Centre

Policy and Coordination Group

TRANSPORT CANADA

by TransVision Consultants Ltd.,

Ergo Systems Canada Inc. and the

Canadian Association of Disability Communicators

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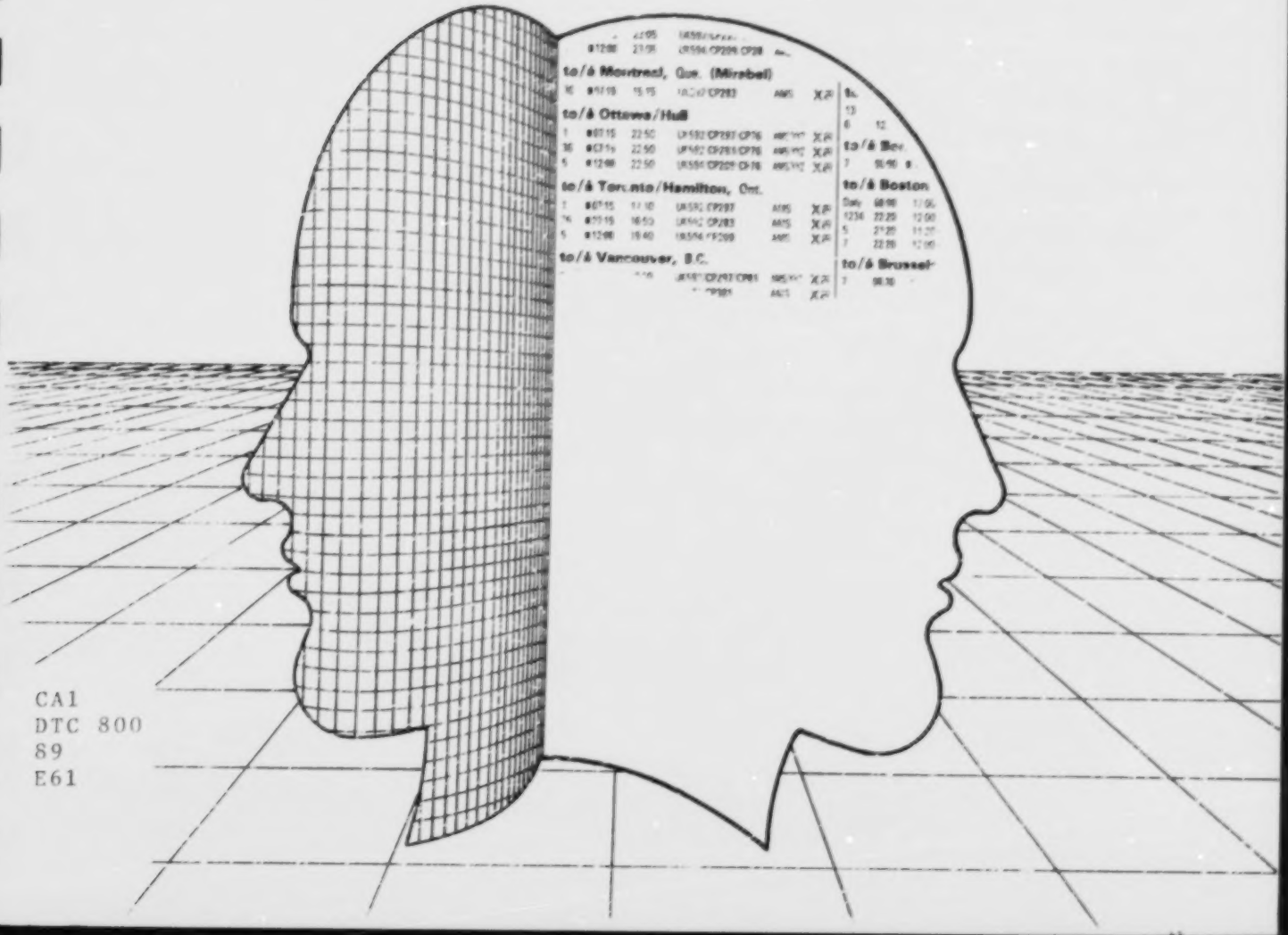

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by Tom Geehan and Ulrika Wallersteiner,
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16. Abstract

The objective of this study was to identify and assess, from an ergonomic point of view, the effectiveness of existing traveller information and communication systems in relation to the specific market segments of travellers with physical, visual, hearing and cognitive disabilities. The purpose of the project was to provide an assessment of existing information system capabilities and to identify current deficiencies and opportunities for improvements for the specific market groups. To meet the requirements, the authors solicited information from transportation operators and authorities, conducted selected interviews, undertook simulated travel scenarios with individuals with disabilities, and organized in-depth focus group sessions with representatives of the four market groups.

Information technologies and communication systems currently used during a trip (planning, terminal and on-board) were reviewed if they formed integral parts of the travelling process. Systems were defined according to their function: timetable, reservation, orientation, procedural, directional, service or emergency.

Existing traveller information systems were reviewed, traveller information requirements defined, deficiencies in current systems were identified, and recommendations were made to ensure the appropriate development of traveller information and communication systems that will meet the needs of the general public, as well as the specific needs of individuals with physical, visual, hearing and cognitive disabilities.

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16. Résumé

L'objet de cette étude est d'évaluer, sous la perspective ergonomique, l'efficacité des systèmes d'information et de communication voyageurs, par rapport notamment aux besoins des voyageurs ayant des handicaps moteurs, visuels, auditifs ou cognitifs. Son but est d'évaluer la performance des systèmes d'information existants et d'en définir les lacunes et les possibilités d'amélioration, toujours dans l'optique des différentes catégories de voyageurs définies ci-dessus. Pour cela, les auteurs ont fait appel à diverses sources d'information, notamment les entreprises de transport publiques et privées, et ils ont interrogé des experts, exécuté des scénarios de voyage avec des personnes handicapées et procédé à des consultations approfondies auprès de représentants des quatre catégories visées.

Les auteurs se penchent sur les moyens d'information et de communication qui font partie intégrante des ressources mises expressément à la disposition du public voyageur aux différentes étapes du voyage (préparation, départs/arrivées, trajet proprement dit). Les systèmes sont groupés selon leur fonction: horaires, réservations, orientation, instructions, signalisation, services ou urgence.

Outre l'étude des systèmes d'information actuellement sur le marché, les auteurs se sont employés, d'une part, à définir les besoins des voyageurs en matière d'information et les lacunes que présentent les systèmes existants et, d'autre part, à recommander des mesures visant à assurer l'aménagement de systèmes d'information et de communication mieux adaptés aux besoins du public en général et des personnes victimes de handicaps moteurs, visuels, auditifs et cognitifs.

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SUMMARY

Traveller information is an essential element of all transportation modes. It is estimated that over $10 million has been spent in Canada developing and implementing new information and communication technologies. Theoretically, these technologies are able to relay more information, more quickly to travellers. More information can be made available than ever before and it can be transmitted more rapidly and diversely.

While government agencies and private firms have allocated significant resources to the development of new information technologies, little or no research has been done on the impact on travellers' comprehension of information, on the ergonomic aspects of the relationships between technologies and users and, ultimately, on ridership. In particular, no analysis has been done relating information systems to travellers by market groups, such as persons with disabilities.

Recognizing the need for a review of existing information systems, the Transportation Development Centre commissioned a study to investigate the situation. The objective of this study was to identify and assess, from an ergonomic point of view, the effectiveness of existing traveller information and communication systems in relation to specific market segments.

To meet the requirements of the proposed study, to support the objectives and to achieve the anticipated benefits, the consultants undertook literature reviews, solicited appropriate information from transportation operators and authorities, conducted selected interviews with knowledgeable authorities in the area of transportation for persons with disabilities, undertook simulated travel scenarios with individuals with disabilities, and conducted in-depth focus group sessions.

Four focus group discussion sessions (one for each of the market groups: travellers with physical, visual, hearing and cognitive disabilities) were conducted to solicit travel experiences and proposals. Simulated travel scenarios were also undertaken with selected volunteers to assess the qualities of existing information systems.

Existing traveller information systems were reviewed, traveller information requirements defined, deficiencies in current systems were identified, and opportunities for improvements delineated. Recommendations were made to ensure the appropriate development of traveller information and communication systems that will meet the needs of the general public, as well as the specific needs of travellers with physical, visual, hearing and cognitive disabilities.

This report on the results of the study is viewed not only as an overview of the research effort but as a basis for facilitating discussion with respect to the application of new information systems in the transportation industry. It is hoped that it will be used as a reference document for future research efforts in the area of traveller information systems.

Information technologies and communication systems currently used during a trip (planning, terminal and on-board) were reviewed if they formed integral parts of the travelling process. Systems were defined according to their function: timetable, reservation, orientation, procedural, directional, service or emergency. Traveller information requirements were defined, deficiencies in current systems were identified, and recommendations were made to ensure the appropriate development of traveller information and communication systems in the future.

Some of the system deficiencies and the issues raised include:

- Recognizing passengers with disabilities, especially individuals with hearing or learning disabilities, made more difficult by the reluctance of self-identification.
- Understanding the limitations and particularly the capabilities of passengers with disabilities so that they are provided with the proper information to make informed and appropriate decisions during the travel process.
- Providing information for passengers that have to access the information using different sensory capacities, especially providing a visual display of auditory messages and information.
- Providing appropriate information for passengers with disabilities: the design of video terminals, information maps, signage, way-finding and orientation cues, and on-board safety briefings.
- Assisting passengers with disabilities, disseminating the knowledge necessary to make a trip, and providing carrier personnel with the training to give personal assistance, especially handling of guide dogs and wheelchairs.

Based on the issues that were raised and the deficiencies noted, recommendations are presented and are summarized as follows:

- Development of more flexible policies for assisting travellers with disabilities, particularly in relation to airplane seating and traveller classification.
- Investigative and research activities to provide a better data base on the format, media and content of information systems for travellers for their use.
- Testing and development of augmentative information systems, particularly the visual display of auditory messages in both vehicles and terminals and the use of auditory and tactile information systems for visual information displays.
- Human factors research and analysis of current procedures and practices, particularly as they relate to provision of instructions and information and onboard safety orientations.
- Improvement of training and education, particularly as it relates to materials for persons with a disability and training for those who will be called upon to assist them.

SOMMAIRE

L'information aux voyageurs est une composante essentielle du service, quel que soit le mode de transport considéré. On estime que le Canada a dépensé environ 10 millions de dollars pour créer et mettre en oeuvre de nouveaux systèmes d'information et de communication voyageurs. En principe, ces systèmes permettent de renseigner les voyageurs mieux et plus rapidement: on peut maintenant transmettre beaucoup plus d'information, sous formes plus variées et en moins de temps qu'auparavant.

S'il est vrai que les organismes gouvernementaux et les sociétés privées ont consacré des ressources considérables à la mise au point de nouvelles techniques d'information, il n'en demeure pas moins que très peu de programmes de recherche ont exploré la convivialité et les incidences ergonomiques de ces nouvelles techniques et, au bout du compte, leur impact sur la fréquentation des moyens de transport. En particulier, aucune étude n'a été effectuée sur les systèmes d'information voyageurs dans l'optique des différents créneaux du marché, notamment le groupe des voyageurs handicapés.

Conscient de la nécessité de faire le point sur les systèmes d'information actuellement utilisés dans l'industrie des transports,

le Centre de développement des transports a commandé une étude visant à analyser la situation actuelle et à définir et évaluer, sous la perspective ergonomique, l'efficacité des systèmes d'information et de communication voyageurs à l'égard de créneaux précis du marché.

Pour répondre aux critères et aux objectifs de l'étude proposée et pour réaliser les résultats escomptés, les consultants ont étudié la documentation disponible, ont sollicité l'information appropriée auprès des entreprises de transport tant publiques que privées, et ont interrogé diverses sources compétentes en matière de transport des personnes handicapées. Ils ont également exécuté des scénarios de voyage avec des personnes handicapées et procédé à des consultations approfondies auprès des groupes intéressés.

Quatre séances de consultation ont été tenues pour recueillir les témoignages et les propositions des quatre groupes ciblés: handicapés moteurs, handicapés visuels, handicapés auditifs et handicapés cognitifs. Des scénarios de voyage ont également été exécutés par des volontaires spécialement sélectionnés pour évaluer la qualité des systèmes d'information actuellement utilisés dans l'industrie des transports.

Les auteurs examinent les systèmes d'information actuellement utilisés et définissent les besoins des voyageurs en matière d'information ainsi que les lacunes et les possibilités d'amélioration des systèmes existants. Ils recommandent des mesures visant à assurer la mise au point de systèmes d'information et de communication adaptés aux besoins des voyageurs en général et à ceux des personnes ayant des handicaps moteurs, visuels, auditifs ou cognitifs.

Ce rapport d'étude a non seulement pour objet de rendre compte des programmes de recherche sur l'ergonomie appliquée aux systèmes d'information et de communication, mais également de faciliter les discussions entourant l'application des nouveaux systèmes d'information dans l'industrie des transports. Espérons qu'il pourra être utile à tous ceux qui s'intéressent à la recherche en matière de systèmes d'information aux voyageurs.

Les auteurs se penchent sur les techniques d'information et les systèmes de communication qui font partie intégrante des ressources mises expressément à la disposition du public voyageur aux différentes étapes du voyage: préparation, départs/arrivées, trajet proprement dit. Les différents systèmes sont groupés par fonction: horaires, réservations, orientation, instructions, signalisation, services ou urgence. Ils définissent en outre les besoins des voyageurs en matière d'information et les lacunes que présentent les systèmes existants, et recommandent des mesures visant à assurer la mise au point de systèmes d'information et de communication répondant aux besoins futurs.

Problèmes et lacunes relevés dans ce rapport:

- Savoir repérer les voyageurs handicapés, en particulier les voyageurs qui ont des handicaps auditifs ou cognitifs et qui répugnent à être identifiés comme tels.
- Savoir cerner non seulement les limites mais aussi les capacités des voyageurs handicapés pour être en mesure de leur fournir l'information qui leur permettra de prendre des décisions adéquates tout au long de leur voyage.
- Fournir l'information nécessaire aux voyageurs qui utilisent une afférence sensorielle autre que celle sollicitée par le moyen d'information utilisé. Ex. : affichage visuel des messages sonores.
- Fournir l'information pertinente aux voyageurs handicapés: adaptation des terminaux vidéo, des tableaux d'information, du système de signalisation, des repères d'orientation et de direction et des consignes sur la sécurité à bord.
- Procurer aux voyageurs handicapés l'assistance et l'information dont ils ont besoin pour voyager, et fournir au personnel des transporteurs la formation dont ils ont besoin pour être en mesure d'aider efficacement les voyageurs, en particulier les passagers voyageant avec un chien-guide ou en fauteuil roulant.

Compte tenu des problèmes et des lacunes relevés dans leur étude, les auteurs ont recommandé l'application des mesures suivantes:

- Adopter un programme d'assistance mieux adapté aux besoins des voyageurs handicapés, particulièrement en ce qui concerne l'attribution des sièges et la classification des passagers.

- Instituer des programmes d'étude et de recherche visant à constituer une meilleure base de données sur la présentation, le support et le contenu des systèmes d'information aux voyageurs.
- Essayer et mettre au point des systèmes de suppléance á l'information, en particulier les systèmes d'affichage visuel des messages sonores diffusés dans les véhicules et les installations terminales, et les systèmes d'information auditifs et tactiles suppléant l'affichage visuel.
- Etudier et analyser les facteurs humains intervenant dans les méthodes et pratiques courantes, dans la mesure où ils peuvent influer sur l'efficacité des instructions et de l'information dispensée aux voyageurs, notamment les consignes de sécurité à bord.
- Améliorer les programmes de formation et d'éducation, en particulier ceux destinés aux personnes handicapées et aux personnes qui sont appelées à leur prêter assistance.

TABLE OF CONTENTS

1. INTRODUCTION 1
Background to the Study 2
Scope and Objectives 3
Approach to the Study 4
Organization of the Report 4

2. MARKET GROUPS OF INTEREST 5
Definition of Market Groups of Interest 6
Persons with Physical Disabilities 8
Persons with Sensory Disabilities 9
Persons with Visual Impairments 9
Persons with Hearing Impairments 11
Persons with Cognitive Disabilities 12

3. TRAVELLER INFORMATION REQUIREMENTS 13
A Traveller's Decision Process 14
A Traveller's Travel Process 17
Procedures for Planning 17
Procedures at Terminals 18
On-Board Procedures 20
Procedures Upon Arrival 21
Information/Communication Needs 21

4. TRAVELLER INFORMATION SYSTEMS 27
Information Components 29
Information Systems 30
Planning Information Systems 32
Terminal Information Systems 35
On-Board Information Systems 40
Industry Practices 42
Air Carrier Practices 42
VIA Rail Practices 45
Information Implications 49

5. INFORMATION SYSTEMS ASSESSMENT 51
Method of Assessment 52
Systems Assessment Results 54
Airline Information Systems 54
Railway Information Systems 61
Discussion of Experiences 64
Travellers with Physical Disabilities 64
Travellers with Visual Disabilities 70
Travellers with Hearing Disabilities 76
Travellers with Cognitive Disabilities 80
Preliminary Conclusions 85

6. CONCLUSIONS AND RECOMMENDATIONS 87
Policies and Guidelines 88
Research and Understanding 90
Testing and Development 91
Procedures and Practices 92
Training and Education 93

REFERENCES 95

APPENDICES
A. Glossary of Terminology A-1/101
B. Characteristics of the Market B-1/107
C. Information Systems Components C-1/119
D. Reservation Simulation Questions D-1/127
E. One Traveller's Experiences E-1/135

LIST OF EXHIBITS

1. Nature of Disability Defined 6
2. Market Groups of Interest 7
3. Traveller's Decision Process 15
4. Traveller's Travel Process 19
5. Traveller Information Requirements 22

6. Information System Components 29
7. Information for Travellers 31
8. Timetable Information 33
9. An Airport Terminal 35
10. Terminal Orientation Display 36

11. Terminal Information Signage 36
12. Airport Check-in Counter 37
13. Via Rail Ticket Counter 38
14. Via Rail Information Desk 38
15. Air Canada Special Services 39

16. Airline Flight Destination Screens 39
17. Via Rail Service Board 40
18. Current Industry Practices 46
19. On-Board Entertainment/Information System 50
20. Response to Reservation Needs 55

21. Rating of Overall Service 55
22. Rating of Agents' Knowledge 56
23. Rating of Airlines' Service 56
24. Rating of Airports' Facilities 57
25. Rating of Airports' Security 57

26. Problems with Information Systems 82

1. INTRODUCTION

Traveller information is an essential element of all transportation modes. It is estimated that over $10 million has been spent in Canada developing and implementing new information and communication technologies. Theoretically, these technologies are able to relay more information, more quickly to transportation users. More information can be made available than ever before and it can be transmitted more rapidly and diversely.

While government agencies and private firms have allocated significant resources to the development of new information technologies, little or no research has been done on the impact of these technologies on travellers' comprehension of information, on the ergonomic aspects of the relationships between technologies and users and ultimately, on ridership. In particular, no analysis has been done relating information systems to ridership by market groups, such as elderly and disabled persons.

In 1987, the Barriers Free Communication Task Force recommended in a memo to the Transportation of Disabled Persons Implementation Committee: "A human factors approach to evaluate the needs and solutions for making the communication aspects of Canada's transportation systems accessible to elderly and disabled people" and "Examine existing technologies for human effectiveness and cost effectiveness".

This project is directly related to those recommendations and is intended to assess from an ergonomic point of view, the effectiveness of existing information systems in relation to defined market segments. The purpose of the project is to provide an assessment of existing information system capabilities and to identify current deficiencies and opportunities for improvements for specific market groups.

BACKGROUND TO THE STUDY

There has been a gradual improvement in the provision of goods and services to consumers who are disabled in our society in recent years. Nevertheless, there remain a great many barriers that inhibit persons who are disabled from participating as fully as possible in our society. This situation was effectively demonstrated in the landmark report of the Special Parliamentary Committee on the Disabled and the Handicapped entitled "Obstacles" in 1981 in which many impediments to participation by disabled persons in our society were identified.

One of the main recommendations of the "Obstacles" report was to amend the Canadian Human Rights Act to protect disabled persons from discrimination in the provision of goods, services, facilities and accommodation. On April 17, 1982, Canada received a new Charter of Rights and Freedoms containing an "equality rights" provision in section 15 which specifically prohibits discrimination on the basis of "mental or physical disability".

In 1983, a National Policy on Transportation of the Disabled was adopted. The policy set out the government's intention to ensure that safe, reliable and equitable services are available to disabled people on all modes of transportation under federal jurisdiction. Development of accessibility standards for most types of transportation facilities began.

With the promulgation of the provisions of the Canadian Human Rights Act and the Canadian Charter of Rights and Freedoms, the adoption of accessibility standards for transportation services were viewed as a means of defining the legal obligations of carriers. Resolving these issues through a cooperative, consultative process was perceived to be a better avenue than through the litigation process.

Setting and enforcing accessible transportation standards is now the responsibility of the National Transportation Agency as a result of amendments to the National Transportation Act on July 7, 1988. The amendments provide the necessary mechanisms for the National Transportation Agency (NTA) to implement the government's policy to ensure further advances in convenient and dignified access to transportation services for disabled persons. They extend to all modes of transport under federal jurisdiction, including airlines, Via Rail, some bus and ferry services. The NTA can now make regulations and set standards to eliminate undue transportation obstacles to persons with disabilities.

Standards are being developed by the NTA to improve accessibility features for persons with disabilities and the purpose of this particular report is to undertake a human factors approach to evaluating the needs and solutions for making the communication aspects of Canada's transportation systems accessible to elderly and disabled people. Hopefully, some standards for information systems and technologies for human effectiveness and cost effectiveness will arise from the research.

SCOPE AND OBJECTIVES

The specific project objective is to improve the quality of information and communication systems available to the public through an assessment of their effectiveness for defined market segments.

The overall project objective is to improve the accessibility to air and rail transportation systems, by all segments of the travelling public, and more specifically by persons who are elderly or disabled. The purpose is to assess and support the planning of research and development activities and disseminate information to a wide audience of researchers, service providers, policy-makers and consumers.

The project scope was such that it included an assessment of information systems used on air and rail transportation modes in Canada by persons with physical disabilities (mobility and agility), persons with sensory disabilities (visual and hearing) and persons with cognitive disabilities. Systems presently used during a trip (planning, terminal and on-board) were included if they formed integral parts of the communication system.

The project requirements entailed a broad range of ergonomic, technical, research and engineering services to undertake the following tasks:

- Identify and describe current and proposed air and rail traveller information systems; collect data on their use; and review all existing research on their effectiveness.
- Identify and describe specific market segments or categories of users in terms of their information needs and group characteristics.
- Determine information and communication system requirements on air and rail transportation modes for the different market segments.
- Assess current information and communication systems capabilities and determine deficiencies of current systems.
- Define and clarify the problems and deficiencies identified and suggest possible opportunities for improvements.

These requirements necessitated a breadth of experience in transportation engineering, ergonomics, human factors, market research and analysis. It also demanded a blend of practical experience with an ability to handle new concepts as they may apply to future solutions to overcome travel barriers. This required an ability to blend the engineering/management sciences with the behavioural sciences -- the socio-psychological factors of science and technology in tandem with the technical/economic factors.

This emphasis on the ergonomic and human factor aspects of traveller information systems was a necessary element of this study. By providing a forum for exchanging the experience of elderly and disabled travellers, the research brought to light deficiencies in current information systems as well as areas for potential improvements.

APPROACH TO THE STUDY

To meet the requirements, to support the objectives and to achieve the anticipated benefits of this study, the consultants undertook literature reviews, solicited appropriate information from transportation operators and authorities, conducted selected interviews with knowledgeable authorities in the area of transportation for elderly and disabled persons, and conducted in-depth focus group sessions and travel simulations with representatives of the market segments of interest: persons with physical (mobility/agility), sensory (hearing and visual) and cognitive disabilities.

Focus group sessions were conducted to obtain an in-depth insight into the capabilities and deficiencies of information systems. Four sessions were conducted, one for each of the market groups of interest. Participants were selected based on their travel experience and their disability. During the sessions, the participants were invited to share and discuss their thoughts and experiences about traveller information systems -- in a group setting and with their colleagues. The focus group discussions were oriented around a topic outline and were videotaped for later analysis.

Travel simulations were also undertaken to provide observations related to the behaviour of information system consumers and information suppliers in an actual travel situation. An assessment protocol was developed for the simulations that covered most of the travel tasks and procedures that are normally undertaken when travelling by air or rail. Selected participants from each of the market groups of interest were then asked to follow the proposed protocol while being observed by an experienced researcher.

Existing traveller information systems were reviewed, traveller information requirements defined, deficiencies in current systems were identified, and recommendations were made to ensure the appropriate development of traveller information and communication systems in the future.

ORGANIZATION OF THE REPORT

The report is organized according to the major tasks undertaken during the project. The five major tasks and resulting chapters for the report, include: (1) Market Groups of Interest, (2) Traveller Information Requirements, (3) Traveller Information Systems, (4) Information Systems Assessment, and (5) Conclusions and Recommendations.

This report is viewed not only as an overview of the research effort but as a basis for facilitating discussion with respect to the application of new information systems in the transportation industry. It is hoped that it will be used as a reference document for future research efforts in the area of traveller information systems.

2. MARKET GROUPS OF INTEREST

In developing transportation policies and programs, it is important to understand the current barriers to full access and to know the numbers of people who might benefit from proposed changes. Accurate information is a necessary element of government policies and programs concerning people with disabilities. Responsible decisions can then be made that will balance different needs and solutions, together with the costs and benefits.

Success in determining an acceptable definition of and accurate data on individuals with transportation limitations in the Canadian population has been fairly limited until recently. Statistics Canada, however, is in the process of developing a national database on disability, using the results of two recent surveys: the Canadian Health and Disability Survey[1] (1,2) and the Health and Activity Limitation Survey (3).

In these two surveys -- the Canadian Health and Disability Survey and the Health and Activity Limitation Survey -- the World Health Organization's definition of disability was used, which is: ".... any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being".

Conducted in October 1983 and June 1984 by Statistics Canada as a supplement to the Labour Force Survey, the Canadian Health and Disability Survey provided accurate data on the numbers and characteristics of disabled persons with transportation limitations in Canada. The survey covered 65,800 households; 15,854 adults and children were identified as having some form of disability; 90 percent of these participated in the follow-up interview. Still lacking, however, were complete data on the institutionalized population.

[1] Numbers in brackets designate references, listed at the end of the report.

Most of the deficiencies with the data from the Canadian Health and Disability Survey were corrected with the results of the Health and Activity Limitation Survey. This survey was a follow-up to the 1986 Census of Population by Statistics Canada. It was the largest survey of its kind in Canada involving approximately 120,000 adults and children, including long-term residents of institutions and other health-care facilities.

The information from the Health and Activity Limitation Survey is currently being correlated with that from the Canadian Health and Disability Survey and the 1986 Population Census -- creating a data base of unparalleled information on the number and characteristics of Canadians with disabilities. The data from these surveys supplies demographic information about respondents and their families, enables comparisons between the disabled and non-disabled population for certain Census variables, and enables comparisons between the two disability surveys.

A review of what is currently known about the incidence of disability in Canada is provided in Appendix B: the numbers, types and causes of disability, and the education, employment, income, travelling habits and transportation limitations experienced by Canadians with disabilities (4).

MARKET GROUPS OF INTEREST

The market groups of interest for this assessment of traveller information systems includes individuals with physical (mobility and agility), sensory (seeing, hearing and speaking) and cognitive disabilities. Definitions of these groups are those used by Statistics Canada:

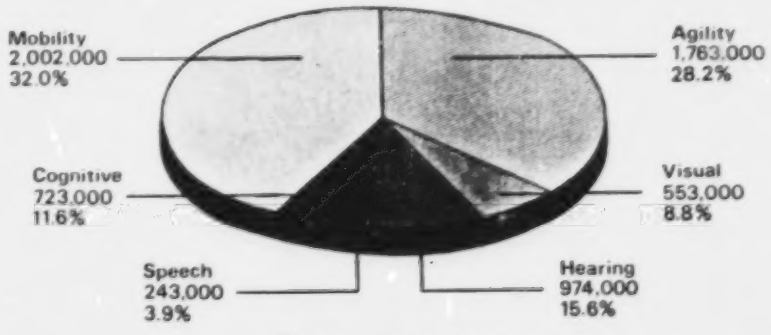
Exhibit 1: Nature of Disability Defined	
Mobility:	limited in ability to walk, move from room to room, carry an object for 10 metres, or stand for long periods
Agility:	limited in ability to bend, dress or undress oneself, get in and out of bed, cut toenails, use fingers to grasp or handle objects, reach or cut own food
Seeing:	limited in ability to read ordinary newsprint or to see someone from 4 metres, even when wearing glasses
Hearing:	limited in ability to hear what is being said in conversation with one other person or two or more persons, even when wearing a hearing aid
Speaking:	limited in ability to speak and be understood
Cognitive:	limited because of a learning disability or emotional or psychiatric disability, or because of developmental delay

Over 3,300,000 Canadians have a disability. Recent figures indicate that 13.2% of the population reported some level of disability. These figures include not only persons who are physically disabled but also persons who have a mental or emotional disability. They include disabled native Indians and reflect the life-styles of all age groups residing in health-related institutions and homes for senior citizens (3).

Persons were considered disabled if they reported any trouble performing one or more of seventeen activities of daily living (e.g. walking up and down a flight of stairs), of if they experienced a limitation in the kind or amount of activity they could perform at home, work or school because of a long-term physical or mental condition or health problem.

Canadians with disabilities cannot be treated as a homogeneous group. They are affected by various types and degrees of disability and many have more than one disability, as illustrated in the following figure.

Exhibit 2: Market Groups of Interest



Persons aged 15 and over

Note Many individuals have more than one disability

The varying and different natures of disabilities makes it difficult to classify and define market groups for the purposes of assessing traveller information systems. Certainly, not all types of disabilities can be considered and representative market groups have to be defined. In terms of their interaction with information systems, some particular disability types may represent the capabilities and deficiencies better than others.

Persons with cognitive disabilities, for example, can include persons with learning, emotional, psychiatric, or developmental disabilities. In terms of their interaction with information systems, this group could also include persons with literacy or language difficulties. To solicit information from some of these individuals would require considerable expense in terms of attendant translators and/or health or therapy assistants. Therefore, a group of individuals, in this case those with learning disabilities, were selected in the hopes that they would be representative of the total group.

Persons with sensory difficulties can include persons with seeing, hearing or speaking disabilities. Each has particular abilities and limitations with respect to information systems. Persons that obtain information from visual cues have very different needs from those that obtain most of their information from audio cues. Therefore, to assess traveller information systems, persons with visual disabilities were considered separately from those with hearing disabilities. Persons with speaking disabilities were not considered separately since it was felt (rightly or wrongly) that most of their needs would be reflected by other market segments and that it would be difficult to contact enough participants within the limited budget.

Persons with physical disabilities includes persons with mobility or agility disabilities. In terms of travelling and interacting with traveller information systems, persons with mobility disabilities (i.e. persons using a wheelchair) were considered to be most representative and would be able to provide the most information on the difficulties encountered.

Therefore, for the purposes of this study, the overall travel market was aggregated into the following market groups of interest (one of which was divided into two market sub-groups of interest):

- Persons with Physical Disabilities: This group included persons with mobility or agility disabilities, people who use wheelchairs and people with problems with movement, coordination and balance; but people who use wheelchairs were considered to be most representative.
- Persons with Sensory Disabilities: Persons with visual, hearing or speaking disabilities were considered in this group; the emphasis, however, was placed on persons with perception and hearing limitations and two sub-groups were defined: **persons with visual disabilities** and **persons with hearing disabilities.**
- Persons with Cognitive Disabilities: Persons with a learning, emotional, psychiatric, or developmental disability were considered in this group. Needs of persons with literacy/language problems are considered here but the emphasis was placed on persons with learning disabilities.

PERSONS WITH PHYSICAL DISABILITIES

According to the Health and Activity Limitation Survey, two-thirds of all disabilities experienced by Canadians 15 years of age and over are related to physical aspects (mobility or body movements). People with mobility disabilities have difficulty walking and moving about, carrying an object, or standing for long periods. People with agility and coordination limitations have problems with movement and balance associated with such activities as standing up, moving about, carrying belongings, using the washroom.

Disabilities relating to physical mobility (i.e, walking and moving about) or agility (e.g., reaching for things) accounted for 60.2% of all disabilities.

Mobility disabilities accounted for 32.0% of all disabilities and were reported by 2,002,430 persons aged 15 and older. Agility disabilities were reported by 1,762,870 persons or 28.2% of all reported disabilities.

People with physical disabilities may use canes, braces, crutches, prosthesis or wheelchairs. People use wheelchairs as a result of a variety of disabilities, including spinal cord injury, multiple sclerosis, muscular dystrophy, arthritis, cerebral palsy and polio. Wheelchairs provide mobility for persons with paralysis, muscle weakness, lack of coordination, nerve damage, and/or stiffness of joints. The reason a person uses a wheelchair can be as unremarkable and common as a broken leg or even pregnancy.

For the purposes of this study, persons with physical disabilities are described as those who require a wheelchair for mobility; they may use a manual or electric wheelchair; and may or may not require an attendant for travel. Using the International Air Transport Association (IATA) definitions, this market group would be defined as non-ambulatory. Persons who are non-ambulatory are unable to walk and board aircraft unassisted, and cannot ascend or descend steps. They require a wheelchair to and from the aircraft or mobile lounge, and must be carried up and down steps, and are unable to walk from the aircraft door to the seat.

Wheelchairs. Wheelchairs come in many sizes and shapes which are adapted to the lifestyle of the user. They range from custom-designed models for sports activities to basic utility models for use in hospitals and airports. Most adult chairs are approximately 28 inches in over-all open width and can fold to a width of about 12 inches. The height is about 36 inches and the length about 30 inches. The weight is about 35 pounds. They may be designed to meet specific needs and may be very expensive. The weights and measurements are important but so is an understanding of the wheelchair and the person in the wheelchair. The human factors involved in using a wheelchair are generally overlooked. Wheelchairs are an extension of the person using them, they are the personal space of the user. They are the person's mobility into society.

PERSONS WITH SENSORY DISABILITIES

Persons With Visual Disabilities

Recognizing persons with perception limitations requires a thorough understanding of blindness, which does not always mean total loss of sight. Sometimes the person who is 'legally' blind can see a little. Some persons can distinguish only the difference between light and darkness; others see in a mist as if a thick white curtain were always in front of their eyes. Still others have peripheral sight, seeing the world around the edges of a great dark mass in the centre of their eyes. They never see a whole shape, but only the top and bottom or the ends. Another group has pinhole sight, with everything blocked off but a tiny speck of light.

According to the Health and Activity Limitation Survey, sensory disabilities account for 28.3% all disabilities: About 553,000 persons, or 18.2% of those reporting a disability, are visually impaired. Of these, about 10.2% are legally blind. Legal blindness is defined as either (1) less than 10 percent (20/200) vision after correction in the best eye, or (2) peripheral vision limited to less than or equal to 20 percent.

People can be born blind (congenital) or can become blind through an accident or disease (adventitious). A leading cause of visual impairment is diabetic retinopathy, a disease where blood vessels break on or in the retina. Other common causes include cataracts (cloudy lens), glaucoma (high pressure inside the eye), retina pigmentosa (damage to the retina), and macular degeneration (hardening of the eye area responsible for fine vision). The cause is unknown in about one-third of the cases of blindness.

Many aids are available to blind and partially sighted persons, but none restores sight. Instead, they use partial vision and/or other senses to enable the visually impaired person to read, write, obtain information or participate in visually oriented activities. Only a few devices are described here to indicate what is available:

Braille. Braille, used by about 6 percent of the people who are legally blind, is a system where persons can read words by running over a line of raised dots with their fingers. A blind person can also take notes and write in braille, using a slate and stylus or a braillewriter. Computers are available to produce braille.

Reading aids. The Optacon is a machine that changes a printed letter into a vibrating tactile letter that a blind person can read with the index finger. Another device is the Kurzweil reading machine, which scans a printed page and reads it aloud through a computerized speech synthesizer. Most blind people also have individuals read printed matter to them. For partially sighted people, large-print materials and magnifying devices are available, as well as a magnifying closed-circuit television that enlarges words and images from four to 60 times their original size.

Listening aids. Because relatively few people read braille, many blind people have written materials read onto tape recorders. For example, 'talking books' are available, as are talking calculators that announce input and output, and computerized tape recorders, called speech compressors, that enable people to speech-read by ear (as an aside, this report was produced on video casette for members of the Steering Committee who rely on their tape recorder to obtain much of their information).

Mobility aids. Blind individuals most commonly use sighted guides, canes, or dog guides when travelling. The choice of aid is personal, based on the individual's needs, lifestyle and abilities. A group of newly developed aids use ultrasonic waves to guide the user by bouncing a sound signal off objects around the wearer of the device.

Persons With Hearing Disabilities

Deafness and hearing impairment is the 'invisible' disability, because it is often difficult to recognize individuals with hearing disabilities.

According to the Health and Activity Limitation Survey, hearing disabilities are experienced by an estimated 973,830 individuals in Canada or 32.0% of the disabled population, of whom 168,000 cannot hear a conversation over a standard telephone, even with the use of a hearing aid.

To be **profoundly deaf** means that an individual has total loss of hearing -- they are unable to hear or understand speech, with or without the use of a hearing aid. A **hearing impairment** usually means that an individual cannot perceive certain frequencies of sound, finding difficult to understand speech through the ear alone or without the use of a hearing aid.

Deafness may occur because of hereditary factors, the side-effects of certain drugs, birth traumas, measles, scarlet fever, meningitis, severe ear infections or because of certain maternal diseases, such as rubella, occurring during pregnancy.

Today, through technology and intensive training, some congenitally deaf persons can learn to speak, yet sign language continues to be the preferred mode of expressive communication among the deaf. Assistive devices and aids include: hearing aids, sign language, written language, telecommunications devices and guide dogs.

Hearing aids. Although there is a variety of hearing aids available and many can help the hearing-impaired, they do not correct the user's condition. Hearing aids simply amplify all sounds, thus making the user aware of the sounds but not necessarily what the sound is or its origin. Hearing aids can rest within the frame of a pair of glasses, within the ear or behind the ear.

Sign language. Most deaf people communicate with their hands (manually) through sign language, which is a combination of hand movements and positions used to express thoughts. If there is no sign for a certain word/thought, finger spelling in which letters are formed by the hand can be used. Sign language has many forms, and dialects exist regionally across the country. Both French and English signs are used.

Written language. If a deaf or hearing-impaired passenger is having difficulty communicating, a pencil and paper may be used to communicate needs. Because many deaf persons speak, sometimes only the hearing person needs to write his or her thoughts.

Guide dogs. Some hearing-impaired persons use hearing dogs (identified by their orange collars) to alert them to noise.

PERSONS WITH COGNITIVE DISABILITIES

According to the Health and Activity Limitation Survey, 11.6% of all disabilities experienced by Canadians 15 years of age and over are related to other (cognitive). Cognitive disabilities (learning, emotional or psychiatric disability, or developmental delay) were reported by about 723,380 persons or 11.6% of the disabled population aged 15 and older. No breakdown is available as yet from the Health and Activity Limitation Survey on the different types of cognitive disabilities experienced by persons who are disabled.

For the purposes of this study, this market group will include people with learning disabilities, developmental delays, emotional difficulties or attentional deficits. Typically, these are people who experience difficulty with reading and writing skills, and have difficulty in direction finding. The problems of travellers with illiteracy or foreign language problems are considered within the context of travellers with cognitive disabilities.

Persons with cognitive disabilities may have trouble absorbing aural formation and/or processing that information; they may experience an involuntary reaction to much information; they may have trouble distinguishing directions or remembering specific facts.

Cognitive problems are complex and varied, manifested by delays in the development of, or difficulties in, the functions of attention, memory, reasoning, co-ordination, communicating, reading, writing, spelling, calculation, social competence or emotional maturity.

Some signs and symptoms that sometimes, but not always, indicate a cognitive disability:

- Hyperactivity or attention deficit disorder.
- Poor handwriting, clumsy or awkward movements.
- Mixed up words and trouble remembering.
- Difficulty grasping concepts such as up and down, left and right.
- Difficulty in distinguishing differences in shape and sound.
- Trouble thinking in logical, orderly way or jump to conclusions, and have trouble planning tasks or understanding consequences.

As seen, inherent in the definition of persons with cognitive disabilities, these persons would likely be affected considerably by deficiencies in traveller information systems.

The social needs of the 3,300,000 Canadians with disabilities requires attention. They are the people considered in this study on traveller information systems. It is important to remember that most of the market segment have a disposable income. They are consumers who should be afforded dignity in travel.

3. INFORMATION REQUIREMENTS

With an aging population, characteristic of many countries like Canada, the elderly and hence the disabled are one of the fastest growing groups in the population. The introduction of new medical interventions are now saving lives at the price of longer-term and severer residual disabilities. In addition, new interventions are in some cases significantly extending the lives of those already disabled. The rise in the standard of living makes special aids and assistive devices more available and acceptable.

These developments present important ethical and public-policy issues that cannot be ignored in any consideration of the needs of people with disabilities of fuller access to society and its institutions.

It is not widely understood that these needs arise because society has been successful -- both in saving and prolonging lives. The social needs of people with disabilities are the price of that success.

Although the numbers of disabled individuals affected by traveller information, from the previous chapter, may not appear large, the implications are: the barriers and obstacles that they face in using transportation systems are the same that affects every individual at one time or another.

Traveller information is an essential element of all transportation modes. All travellers require information in order to decide to take a trip and in order to take the trip safely and securely. Information is required on routes, fares, schedules, services and safety procedures. As much of this information is conveyed in printed or audio form, problems are often created, especially for sensory and cognitively disabled individuals. But, **all** individuals require readily available information to travel.

A TRAVELLER'S DECISION PROCESS

A model of the decision process that a traveller is posited to go through in choosing to take a trip is illustrated in the exhibit on the opposite page. This model, which represents an approach to understanding the traveller's decision process, has its antecedents in consumer behaviour models. It is multi-purpose in that it can be applied to any type of trip made by almost any type of consumer in a position to make their own decisions. It reflects the belief that trip choice is a function of three groups of decision variables: transportation system characteristics, trip characteristics, and trip-maker characteristics.

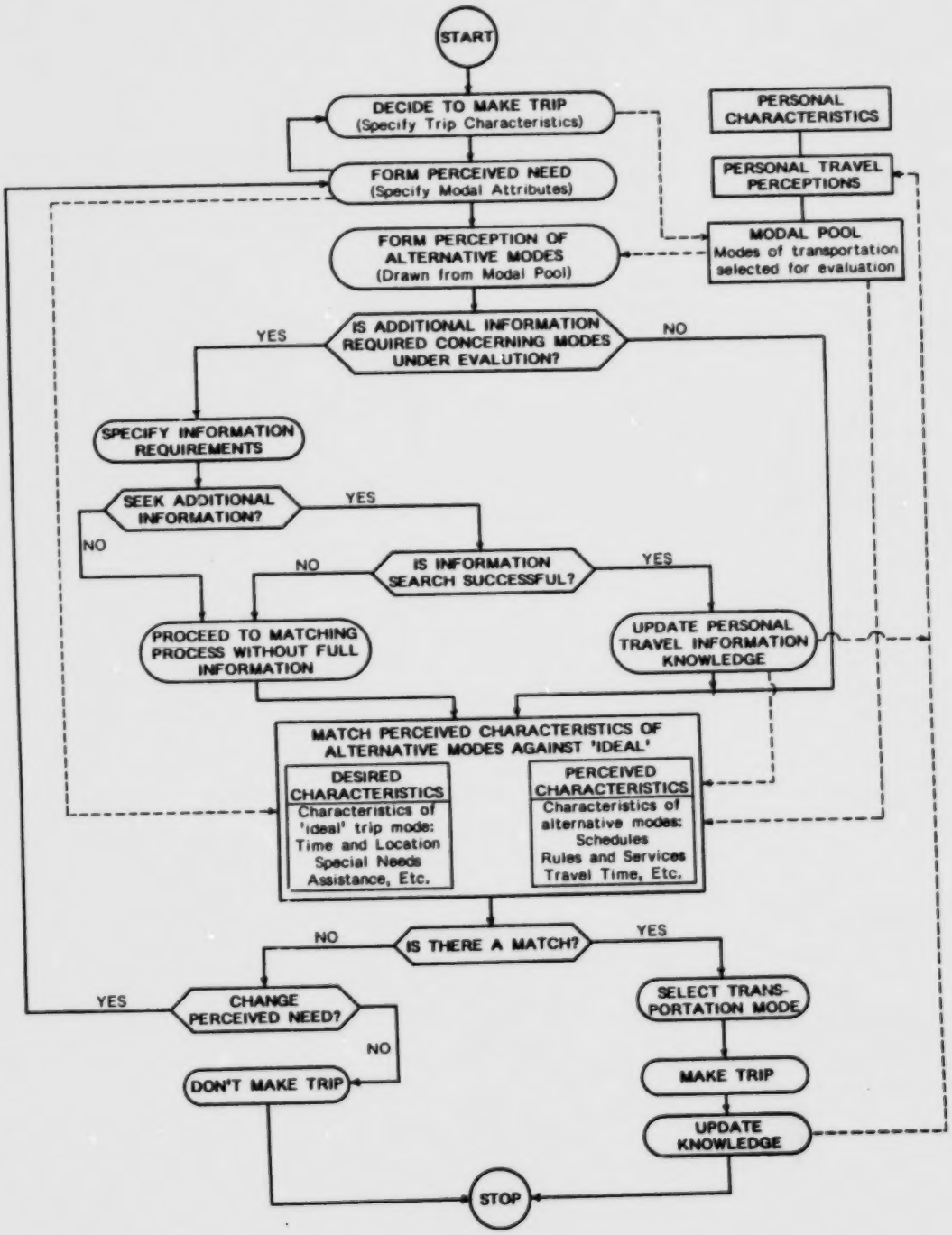
Transportation is, of course, a derived demand, and so the modal choice decision is preceded by the consumer's decision to make a trip which will satisfy other needs. Each trip has specific characteristics of its own which will have a major impact on the consumer's choice of transportation mode. Consequently, the model calls for the consumer to specify the characteristics of the trip, notably the origin, the destination and the time of the trip; other important considerations might include the number of other people who would be going along too, the purpose of the trip, and the prevailing weather conditions, etc.

Having specified these trip characteristics, the consumer prepares to formulate the perceived transportation needs for the trip. As indicated by the dotted lines, these specifications are partly determined by personal characteristics, personal perceptions and past experience (stored information). They constitute an 'ideal' solution to needs -- the choice criteria against which the various alternatives which may be available will subsequently be evaluated.

Now the consumer is ready to begin the search and evaluation process which will lead to the final decision. Information is the main factor here; but personal characteristics and stored information, as modified by values and attitudes, play a part. Personal characteristics refer to demographic, physical, physiological and personality factors. Stored information, representing past experience and awareness of the availability of alternative modes and routes, constitutes an important determinant.

At this point, the consumer selects one or more modes for further evaluation and forms perceptions of the characteristics of each. The immediate question is whether there is sufficient information to make a decision. The consumer may be thinking about taking the train, but doesn't know where the station is, what the schedules are or how much it costs. If the information is known, the consumer can proceed straight to a decision. If not, the consumer is posited to specify the information requirements. The trouble of seeking this information, however, may or may not be taken -- it may be too difficult to search for or it may be tried without success. Either way, the final decision may be taken without the benefit of full information, with the risk that it may not be the best decision.

Exhibit 3: Traveller Decision Process



Information is required to make a good decision, to update the consumer's knowledge and to record the learned information for future reference.

With the necessary information, the consumer is ready to compare the perceived characteristics of the transportation alternatives against the previously defined choice criteria. It is hypothesized that a mode will be selected whose perceived attributes (cost, convenience, comfort, etc.) most nearly match the desired attributes, the emphasis being on meeting those criteria which are held to be the most important, but allowing for trade-offs between characteristics. There is no guarantee, however, that a satisfactory match will occur. If a match results, the consumer would take the trip and update his personal perceptions based on this experience. If no match results, the trip would not be taken or the perceived needs would have to be changed.

The value of this model is that it highlights the information that is needed to understand travellers, their trip-making behaviour and the transportation alternatives available and it can be applied to virtually any type of modal choice decision.

At the outset, it is desirable to know something about the travellers -- their physical or functional limitations and abilities. It is also desirable to know something about their attitudes and value structures concerning transportation alternatives which is a function of past experience, exposure to advertising, word of mouth, and so forth. It is necessary to know something about their actual trip making experiences and -- most important -- it is necessary to know about their information requirements and their success in obtaining the required information to make an effective decision. The traveller decision model explicitly recognizes the impact of psychological and physiological variables upon traveller decisions and it recognizes the traveller's need for information.

By emphasizing the needs of individuals rather than those of a mass market, the model gives explicit recognition to the existence of identifiable market segments which may have sharply differentiated needs. Once individual variables in traveller characteristics are recognized and key points in the decision process identified, then opportunities for influencing such decisions through the supply of appropriate information become clearer. Behavioural theory argues that each individual can have different needs and perceptions and that it may be possible to change perceptions of key characteristics through persuasive communications.

Individual's information is updated following a successful information search and again following the actual trip. Few travellers, however, make decisions on the basis of perfect information, so that providing them with more information can potentially result in a change of behaviour, if the message in question can survive the triple hurdles of selective attention, perception and retention. Information is required for planning a trip, for getting to a terminal, moving around a terminal and on-board the vehicle.

A TRAVELLER'S TRAVEL PROCESS

During the travel process, the traveller has to undertake certain procedures or tasks at various stages of the trip: planning, terminal and on-board. The various tasks undertaken and the information requirements to undertake these tasks are described in this section of the report.

Procedures for Planning

Travel reservations and payments can be made directly with the carrier by telephone or at the terminal, or through a travel agent. Both airline/rail reservationists and travel agents can explain the many fares and their varying restrictions. They can provide a variety of travel times and fares to choose from so that the most suitable route can be selected. Major credit cards, cash or certified cheques are preferred methods of payment.

For the disabled traveller, any special requests should be made at the time of making the reservations; for example, for pre-boarding and deplaning assistance, escort assistance, special diet (salt-free, fat-free, vegetarian) or an airline wheelchair. Concerns regarding wheelchair handling, battery care, personal attendants, braille or cassette information availability should be expressed. Increasingly, travel agencies are utilizing computers to record special needs requests. When the agent or reservationist is informed of a disability, a variety of questions may be asked. These questions are used to provide a 'disability classification' which is stored in the computer and utilized at various stages of the journey by the carrier personnel to assist in meeting the traveller's needs.

Seat selection is essentially on a first-come, first-served basis. Some airlines permit passengers to preselect seats at the time of booking flights. Many disabled travellers have preferences, such as being seated for maximum leg room, near washrooms or on the aisle. Visually-impaired travellers with dog guides often prefer a window seat so that seat mates need not climb over the dog and the dog doesn't block the aisle. Hearing-impaired travellers often prefer aisle seats to facilitate communication with flight attendants. If preselection is not possible, it is important to arrive well in advance of boarding time to ensure suitable seating.

A written itinerary provided by most travel agents usually includes a record locator or reservation number that can be quoted for reconfirming flights. If more than one airline is needed for a trip, the originating carrier will usually make all the reservations, but each airline should be contacted directly to request special services and ensure proper procedures for disabled passengers. This is particularly important for wheelchair travellers, as airlines are not always consistent in levels of service.

Travel tasks for trip planning and reservations, therefore, include: acquire information, read information, make a trip plan, determine needs/services and make a reservation. Information requirements are varied.

Procedures at Terminals

Many airline and rail terminals have special parking spots for disabled passengers. Though some terminal buildings have a baggage service with 'skycaps' who will check luggage through to the destination at the entrance of the terminal, more often than not the first step will be to go to the ticket counter and present your ticket. Even if a boarding pass has already been received, it is necessary to check luggage and, for most special services, to check in at the counter.

If a seat has not been preselected through a travel agent, once the airline agent takes the ticket, seating preferences will be requested. Bags will be assessed for size and weight and tagged, and a claim check will be attached to the ticket wallet. A boarding pass will then be issued and directions will be provided to the appropriate departure gate. If there is a connecting flight, the person is advised to check their bags and wheelchair through to the final destination to avoid claiming them between flights. An airline wheelchair can be requested for use between connections.

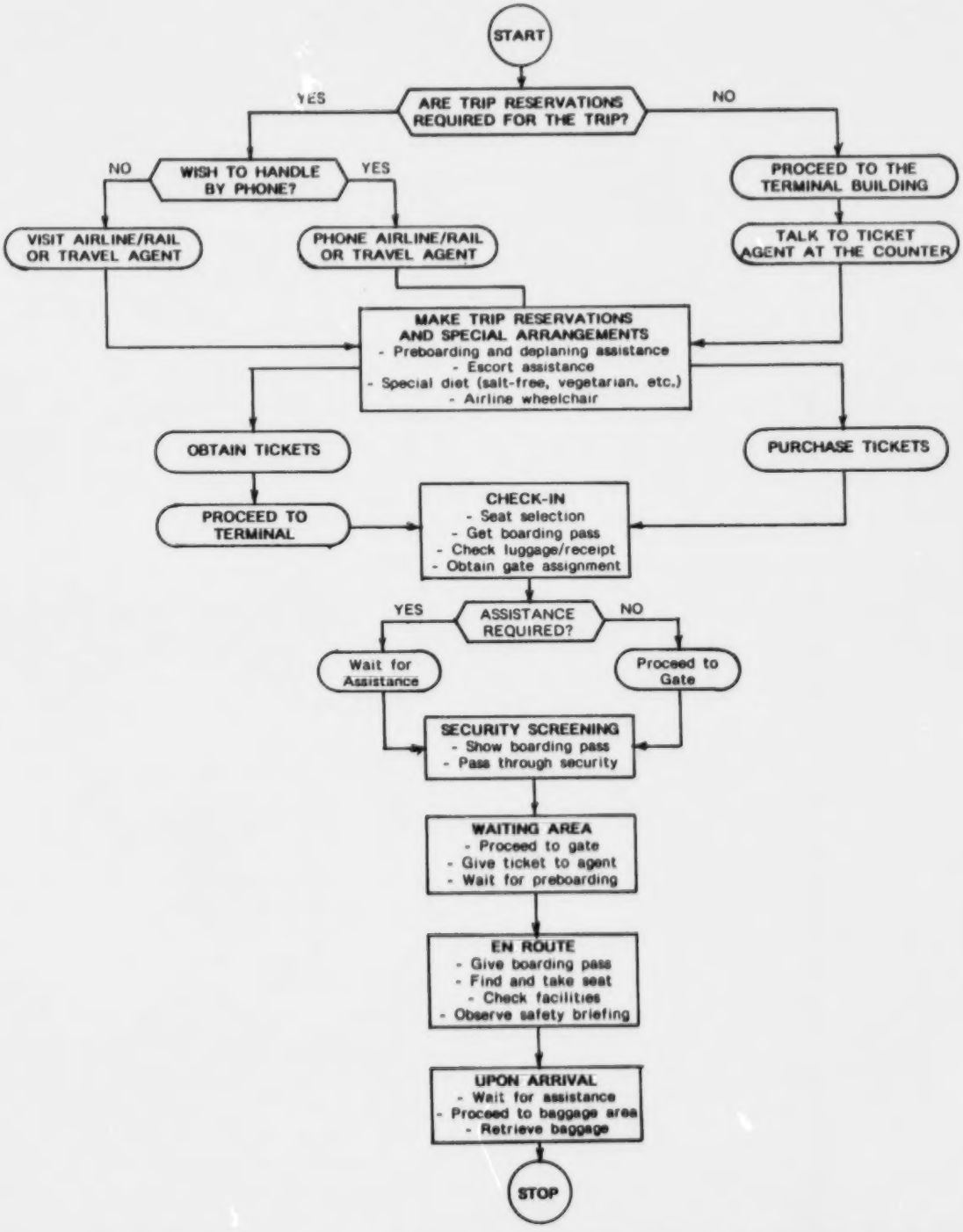
Most check-in times are one hour to 90 minutes prior to flight time for international travel or 30 minutes for a domestic flight. For passengers requiring pre-boarding or escort assistance, special seating or storage of batteries for a wheelchair, it is preferable to check in one hour before the usual check-in time. Rail passengers should check in at least 60 minutes prior to departure time, if pre-boarding and manual lifting or assistance is required, or if baggage check-in is needed.

Elderly people requiring wheelchair assistance for a long distance through the terminal or others with mobility limitations are advised to request wheelchair pre-boarding at the time of booking and reconfirm this service when checking in, making the appropriate arrangements at that time. A request for a wheelchair at the destination gate can also be made.

For air travel, every passenger is required to pass through a security gate to the departure area. Hand-carried luggage is placed on a movable belt for inspection and then the individual passes through an electronic scanner which activates an alarm if firearms, knives or other metal objects are detected. Dog guides may be briefly separated from their masters due to the dog's metal collar. Alternatively, a visually-impaired person and dog guide may be examined with a hand-held detector. If an electronic guiding device for the blind, a pacemaker, brace, artificial limb, metal cane, or a hearing aid is used, the security staff will provide separate security clearance using the hand-held detector.

There is a holding area for all passengers near the departure gate. People requiring pre-boarding assistance are boarded before other passengers. The maximum time for pre-boarding would normally be fifteen to forty minutes ahead of departure, depending on the type of aircraft, the number of passengers and whether or not the flight originates at that airport.

Exhibit 4: Traveller Travel Process



On-Board Procedures

On entering the jetway or plane the traveller gives the boarding pass, with the seat designation on it, to the airline attendant and is then directed or assisted to their seat. Physically disabled people who need assistance to their seats are typically preboarded. It is a good service, some major carriers have an aisle wheelchair that is available on request. Though deaf people are not pre-boarded, they are advised to notify the flight attendant on boarding the aircraft so that they can be alerted to information announced during the trip such as delays, connections and weather disturbances.

After pre-boarding, flight attendants provide briefings on safety procedures, point out service areas, stow canes and crutches, familiarize the disabled passengers with call buttons and other conveniences, and assist them to their seats. Some airlines have safety cards and menues in braille; blind people are often direct physically to the exit doors by flight attendants as well as to the nearest lavatories, or this information is given verbally.

No-smoking and fasten seat belt signs are indicated visually and with a tone or beep. Flight attendants will usually alert blind people to them and point them to hearing-impaired persons.

Prior to take-off, the flight attendants demonstrate evacuation procedures and the use of safety equipment, oxygen and floatation seats. On some large airplanes, a video is shown on the movie screen which is helpful to people who are deaf, as is the explanation card in the pocket attached to each seat (videos, of course, would be more useful if they were open-captioned or had a signer insert). The verbal explanation is helpful for people who are blind (they may be briefed as well when pre-seated). If not, an explanation from a flight attendant should be requested.

Depending on the length of time of the flight, various services are provided after take-off, e.g. magazines, headsets for stereo music or movie soundtracks, as well as beverage and meal service.

Flight attendants can help in a number of ways: by directing blind passengers to the washroom, alerting deaf people to announcements or cutting up food for persons with limited hand function. However, though some flight attendants extend personal services beyond this, it is not their responsibility to feed passengers, to empty catheter bags, to help someone to the lavatory or to administer medications and other personal or medical care (this also applies to Via Rail personnel).

Planes begin descent about twenty minutes before landing. Those with connecting flights should inquire about the location of the gate for the next flight, giving the airline and number to the flight attendant. When special services are arranged on departure, a message is relayed to the destination airport. It is still advisable to remind the flight attendants if escort assistance or wheelchair delivery to the aircraft door is required.

Procedures Upon Arrival

If you require special assistance, you will normally leave the plane after all other passengers. This is not a bad idea. The congestion has cleared and by the time you reach the baggage claim area the crowds will have subsided. Assistance will be offered for your transfer to either your chair or the airline's chair. Request in advance that your wheelchair be at the airplane door on deplaning; repeat this request to the senior flight attendant on the aircraft. Some airlines may not comply and will deliver your chair to the baggage claim area; others routinely arrange to meet passengers with their wheelchair at the aircraft door.

Passengers arriving by commercial aircraft are given a "Traveller Declaration Card" to complete on board the aircraft prior to arrival. Provision is made on the card for identification of any exemption claimed. Travellers proceed to a customs and immigration area, if applicable, where you are required to show identification and answer questions about your citizenship and the purpose of travel. Customs and immigration procedures are routinely carried out when you enter the country, and sometimes before departure. In some cases your ticket is stamped and you may be given a card. You then proceed to the baggage claim area where luggage porters are normally on hand to assist you with luggage. Carts are sometimes provided.

Procedures for examining luggage vary from country to country. Some places may check your baggage upon arrival and departure. Sometimes this is done on a random selection basis and sometimes every passenger's luggage is checked. Officials want to ensure that you are not bringing illegal or unclaimed goods into or out of the country.

You then enter the arrivals areas where there are taxis, buses, hotel shuttles, car rentals, telephones and direct lines to hotels. It may be that you have been escorted to this area, and from there you are on your way.

INFORMATION/COMMUNICATION NEEDS

Inter-city travellers must receive information and communicate with public carriers throughout their journey. Information is needed on routes, fares, and schedules for trip planning, while communication is required to make reservations and to make requests for services. If the disabled traveller has additional needs, such as special meals, they must be able to express these needs to the booking agent. Information and communication needs extend to the terminal and on-board portions of the trip.

A summary of the information and communication needs of disabled travellers is presented in Exhibit 5 on the following pages. Needs are identified for each of different elements of an inter-city trip, required tasks are shown and typical questions that may be asked are noted.

Exhibit 5: Traveller Information Requirements

TYPE	CONTENT	TASKS REQUIRED	INFORMATION NEEDS
Planning	Comprehensive information	Acquire information	What air and rail carriers provide service to the desired destination? What information do I need to make a choice between carriers? Where do I obtain general travel information? Are there books or brochures to assist the disabled traveller?
	Specific information	Read/understand information	Does the air or rail carrier have service to the desired destination on the day and at the time that you wish to travel? Which would be the best or most direct route and what time of day is most suitable? Are their terminals easily accessible from my origin and destination?
	Individual information	Make a trip plan	What is the most economical fare to my destination and accompanying restrictions? What is the fare for personal attendants and what are the qualifications? Are there reduced fares for senior citizens? What are they? What are the qualifications? Is there a direct flight to my destination? If not, what are the connections?
	Special service information	Determine needs	Are there seats on the aircraft which have been specially adapted for use by disabled passengers (e.g., aisle seats with moveable armrests)? Are there seats which the carrier does not make available to persons with a particular disability? Which are most suitable? Is a meal being served on the trip and can I get a special diet meal (salt-free, vegetarian)? Can my wheelchair be retrieved by the ground crew at my destination for deplanning? How must my batteries be prepared for the trip? Is there special packing materials required? What is the policy for guide dogs? Seat selection? Do I have to sit in the bulkhead seat?
	Detailed trip information	Make a reservation	How do I make a reservation and select a seat? Where do I go to purchase a ticket and how do I pay for the ticket? What are the restrictions? Is the carrier notified of my special needs? Is it printed on my ticket? Is there a particular time when the service is especially crowded, i.e. during holidays, when travel is not advised? Could I get a detailed trip itinerary?
Terminal	Terminal access information	Go to terminal	Is there parking for the disabled and, if so, where is it and how is it signed? How do you get from the parking lot to the departure area? Where is the unloading/loading area closest to the desired entrances?
	Instructions for information availability	Find assistance	Where do you go to obtain general information? How are information booths identified and are they staffed with persons sensitive to the the needs of persons with disabilities?
	General information	Follow directions	Is there a map available on the terminal facilities? What do the various pictographs mean? What do the signs mean?
	Instructions for directions in terminal	Find way	Where is the ticket purchase/validation counters for my airline? Which lineup do I enter? Where are the washroom, dining, retail, etc. services?

TYPE	CONTENT	TASKS REQUIRED	INFORMATION NEEDS
Terminal (cont'd)	Instructions in case of emergency in terminal	Follow procedures	How is one notified of an emergency and a need for evacuation? Where are the 'refuge areas' and emergency exits? What are the emergency alarm procedures for persons using a wheelchair?
	Information on services for disabled travellers	Use facilities	Where are the accessible washroom facilities? Is there a special boarding area and personal assistance for disabled travellers?
	Directions for ticket purchase/validation	Obtain ticket	Can I get a boarding card? Does it provide an indication of my needs?
	Directions for baggage handling	Check baggage	Is the cargo bay too small to carry an electric wheelchair? Is cabin storage space available for crutches?
	Information about flights/times	Use visual displays	What is the scheduled departure and arrival time for my flight/train? Are accessible lavatory facilities scheduled for a given flight?
	Information about boarding	Ask for assistance	Is the entrance stairway too narrow to accommodate a boarding chair? Is there a means to get a disabled passenger to their seat? Who carries the wheelchair? Are there other structural limitations on the ability of a disabled passenger to enter and use the aircraft/vehicle? What procedure is used for smaller planes that are boarded from the outside?
	Indication of boarding locations	Find direction/gate	Where do I go to board the aircraft/vehicle? Can assistance be provided to get me to the boarding location?
	Location	Determine location	Where am I located now in the terminal?
	Time	Determine time	What time is it?
	Directions for boarding/departure	Board vehicle	Is the plane departing on time and is it time to board the vehicle? How much time do I need to go through security? Can I request that my personal belongings be inspected by hand? What about pacemakers? Who do I show my boarding pass to and who collects the boarding pass and ticket? Can assistance be provided to my seat?
Onboard	Instructions for travel and general comfort	Find seat and use facilities	Where do I sit and where do I stow my personal baggage? What are the comfort controls (lighting, air, etc.) and how do I use them? Where are the washrooms and how do I make use of them? What did the Captain just say over the public address systems?
	Instructions in case of emergency situations	Understand emergency procedures	What is the procedure for emergency situations? What happens in the event of de-presurization. Can I receive an individual emergency briefing? Is braille or tape cassette info available? Are the video briefings open-captioned?
	Door operation and exit instructions	Use emergency equipment	Where are the emergency exits, how do they operate?
	Instructions for customs and immigration	Fill out forms	How do I fill out the custom declaration form? Where do I go upon deplaning?

In the terminals, the traveller needs orientation information upon arrival and for travel within the terminal. Directional information for arrivals and departures is required, as well as gate or boarding locations and time. Information for ticketing procedures is required. The traveller may also wish information relating to the location of terminal facilities, e.g. food services, washrooms and special services. The traveller must be aware of, and understand, most audio announcements and all emergency alarms.

On-board the vehicle, the traveller must be able to communicate with the flight or service attendants for information on services, use of facilities and emergency procedures. The traveller must also be aware of, and understand, most audio and visual announcements and all emergency alarms and procedures.

Much of the information and communication that guides the intercity traveller is conveyed by print, signs, audio messages or through dialogues with employees of the carrier. Problems are therefore created for sight, hearing and speech impaired travellers who do not have full access to the information provided by carriers and terminal operators.

Sight-impaired travellers face both communication and mobility problems. These travellers rely heavily on audio and tactile sources of information. As a result, sight impaired travellers are often unable to use printed schedules and maps, and have difficulties with orientation in terminals, identification and pick-up of baggage. They rely on audio announcements and may have difficulties if these are unclear or incomplete.

On the other hand, hearing-impaired travellers rely primarily on visual and tactile sources of information and must often communicate using visual signals. This group of travellers have special needs for those aspects of inter-city trips where information is orally transmitted such as making reservations by telephone or being informed of changes in departures and/or arrivals through audio announcements. Speech impaired travellers have similar needs since they rely on visual and tactile methods to communicate their requests and responses to ticket agents and other service personnel.

Cognitively-disabled travellers may have trouble absorbing or processing information, they may experience an involuntary reaction to too much information, and/or they may have trouble distinguishing directions or remembering specific facts. Their needs span the entire spectrum of information and communication systems and their needs may be similar to persons who experience foreign language or illiteracy problems.

Physically-disabled travellers may have few communication problems attributable to their disability but may have difficulties in communicating their needs to the carrier's personnel and ensuring that those needs are communicated internally to the appropriate personnel throughout all stages of the journey. If the needs cannot be met, new information from the carrier must be communicated with the traveller.

Travel information systems include: printed materials (e.g. schedules, printed media advertisements), telephone enquiry systems (e.g. pre-recorded flight schedule departures), airline/rail agents or travel agents (by phone or in person), computerized travel information systems accessed by travel agents and in-flight travellers (e.g. airline reservation system, systems such as Communi-Caid), terminal orientation and directional information (e.g. maps, signs, service destination boards), ticket agents and flight/service attendants, on-board brochures and information briefings, and so forth.

Usually these travel information and communication systems are developed by different parties with little standardization or uniformity; groups with different needs access the travel information systems -- varying disabilities, experienced versus inexperienced travellers, travel agents.

Improved travel information systems should provide benefits for all travellers in terms of increased ridership, safety and convenience for the travelling public as well as increased dollars for the travel industry -- carriers, hotels, and travel agents.

4. INFORMATION SYSTEMS

For a transportation service to be used, the public must know where and when the service is provided. Information is an essential element of a transportation service. Traditionally, network maps and schedules have been used in an attempt to provide the necessary information to the general public. These, however, are being superseded by new methods of communicating information to travellers.

New methods of communicating information to travellers are of particular interest since the network and timetable structures are so complicated that users encounter difficulties unless they are provided with additional assistance (5,6). The need to be informed can only be partially satisfied without the application of information technology. The decision whether or not to travel often depends on usable, factual information about the proposed journey at the decisive moment -- and this is only possible with the recent developments in information technology and communication systems.

The recent developments in information technology and communications have brought about a major change in the quality of information that can be made available to travellers. More information can be made available than ever before and it can be transmitted more rapidly, flexibly and diversely. The technical capability is available for fast, effective communication with the general public, providing the traveller with more usable, factual information.

The capabilities of information technology and communication systems have progressed concurrently over the last few years with an increasing interest in the needs of the general public. This consumer-oriented approach to transportation has developed at the same time as society has become more

technology-oriented. The consumer-oriented approach has also been viewed as a means to increase patronage and productivity and thereby improve the efficiency of existing services and facilities.

The consumer-oriented approach recognizes that there are different segments or categories of travellers containing individuals who have differing information needs based upon personal, social and economic characteristics and their involvement with the transportation system. The different categories of travellers include the following:

- **regular travellers**, who use transportation for on a regular basis. Since they are largely familiar with the service, a minimum information requirement can be assumed, and
- **occasional travellers**, who use transportation for a specific trip, are not very familiar with the service and, therefore, have a correspondingly high information requirement. Occasional travellers include:
  - **unacquainted travellers**, who are strangers in the country,
  - **exceptional travellers**, who use the service only exceptionally,
  - **foreign travellers**, who have additional communication difficulties and are unacquainted with the local situation, and
  - **disabled travellers**, who have certain functional limitations which may or may not relate to communication difficulties. These travellers also include a number of different market segments:
    - travellers with **physical** disabilities, such as limitations in mobility (walking and moving about) and agility (reaching and grasping).
    - travellers with **sensory** disabilities, such as limitations in ability to see, hear or speak and be understood.
    - travellers with **cognitive** disabilities, due to a learning disability or emotional or psychiatric disability, or because of developmental delay (experiencing some of the same difficulties as foreign or illiterate travellers).

The scope of the information required for these travellers varies from minimal route-specific timetable information to complete trip planning information about how and where to use the service. The method of conveying the information to the user can range from printed materials to interactive video display terminals. The information can take the form of various combinations of symbols, colours, numbers or names. All of these components of information have to be considered when assessing current information systems for particular market segments or when developing new information systems that will meet the needs of the traveller and each component must be carefully coordinated with the other components.

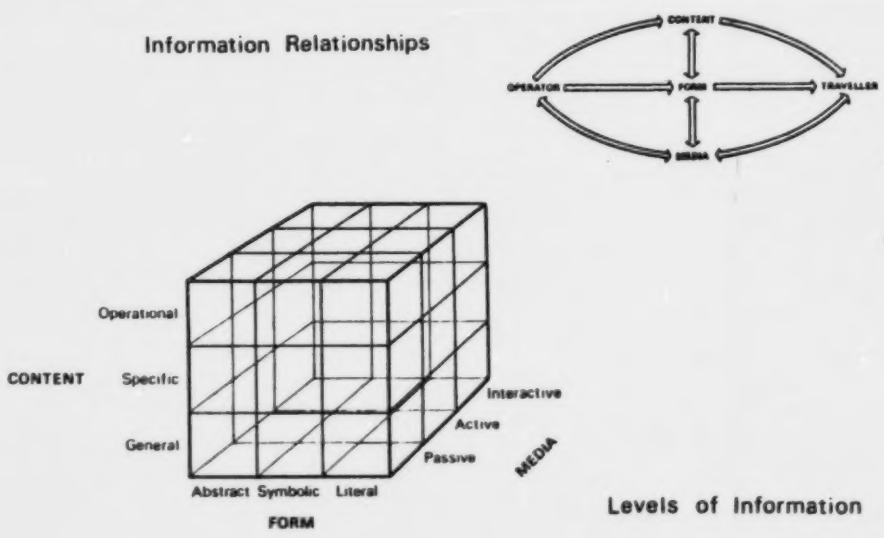
With this consumer-oriented approach to transportation, information technology is of prime interest -- relating as it does to human communication processes and to the handling of what is conveyed in those processes; that is, information. Information that can be used to affect individual behaviour. Information that can be used to alleviate fears and anxieties. Information that can be used to change attitudes, improve the image of the transport operation and to increase ridership and revenues.

INFORMATION COMPONENTS

Every information system consists of several components that must be coordinated in their content, form and media. Content, form and media are the irreducible, basic components of all information.

The **content** is primarily what is being expressed, directly or obliquely; it is the character of the information, the message. The message is composed with purpose: to tell, express, explain, direct, inspire, affect. The **form** is the method of presentation: the design and arrangement of the basic elements of the message. The **media** is the location and method of conveyance of the message. It is the interface, the channel of communication between the operator and the traveller. Form is affected by content; content is affected by form. The message is cast by the transport operator; received and modified by the traveller (7).

Exhibit 6: Information System Components



Information systems may be thought of as having three broad levels of **content** -- varying from quite general information to specific schedule and even current real-time operational information. The **form** of the information can be abstract, symbolic or literal. Various forms are often combined; for example, abstract and symbolic forms, such as colours and pictograms, may draw travellers attention to more literal information. The **media** is differentiated by the level of interaction **afforded the traveller** -- passive, active or interactive. Print is a passive or static type of media; signs and audio signals may be passive or active; and personal interaction is considered interactive (see Appendix C for discussion of components).

INFORMATION SYSTEMS

In considering information systems, the number of choices open to the information problem solver are overwhelming. The options are vast and the forms and media many; the three dimensions of information interact and it is through this interaction that the character of the message takes form. In the exhibit opposite, information content, media and form are related to the function and location of information for travellers. In reviewing specific systems, we must concern ourselves with form and content, their interactive relationship, as well as the character of the individual elements. In addition, information systems are governed by intended meaning for individual personal and cultural environments. And the last consideration is the medium itself, which through its own character and limitations will often determine the type of system.

Despite the preceding considerations, there is an obvious trend in information systems for travellers, one that can be used to simplify the complexity of the problem and provide broad categories for analysis, and this trend is towards improved availability of information through the application of new technology. The transference of information processing from trained personnel to technological devices not only reduces personnel costs but allows for greater user accessibility through a broader placement of relatively inexpensive media. At the same time, improved systems of communications allows for economies inherent in the centralization of information storage and retrieval devices.

The complexity of information systems does not therefore defy definition. The trend resulting from the application of new technology illustrates a number of possible categories of systems as perceived by the traveller:

- **planning** where the telephone, printed media or personal contact is a means of providing a large amount of information to travellers;
- **terminal** where various visual or acoustical signal systems may be placed for providing direction, location and/or time information; and
- **onboard** where selective information may be provided through signs, briefing cards or personal contact with transportation personnel;

The following information systems for the provision of information for travellers are presented according to these categories. These information techniques enhance the quality and availability of information to travellers. The techniques are considered according to the content of the information provided, the media used for accessing and disseminating the information, and the form and the function of the information system.

The systems are outlined in greater detail in the following paragraphs. Although specific individual systems of particular interest to transportation carriers have been selected for illustrative purposes, they should only be considered indicative of the alternatives possible. The main traveller information systems will be described but there are many others.

Exhibit 7: Information for Travellers

TYPE	CONTENT	MEDIA	FORM	FUNCTION						
				PLANNING		TERMINAL			ON-BOARD	
				TIMETABLE	RESERVATION	ORIENTATION	PROCEDURAL	DIRECTIONAL	SERVICE	EMERGENCY
Planning	Comprehensive information	Documents, maps, timetables, guides	Legend, numbers, colours, illustration	■						
	Specific information	Schedules and airline guides, brochures	Legend, numbers, colours, illustration	■						
	Individual information	Travel agents and airline agents	Speech	■	■					
	Special service information	Travel and airline agents, brochures	Speech or legend, symbols, illustration		■					
	Detailed trip information	Travel and airline agents, ticket	Speech or legend, symbols, illustration		■					
Terminal	Terminal access information	Phone, info centres, sign/transparency	Speech or legend			■				
	Instructions for information availability	Sign/transparency	Pictogram ('information') with arrow			■				
	General information	Maps and brochures	Legend, numbers, pictures, symbols			■				
	Instructions for directions in terminal	Signs/transparencies, pictograms	Legend, numbers, pictures, symbols			■				
	Instructions in case of emergency in terminal	Loudspeaker, attention signal transmitter	Optical or acoustical signals				■			
	Information on services for disabled travellers	Airline/rail agents, information officers	Speech				■			
		Documents, brochures, leaflets	Legend, numbers, colours, illustration				■			
	Directions for ticket purchase/validation	Sign, ticketing agent	Legend, pictogram speech				■			
	Directions for baggage checking/handling	Sign, ticketing agent	Legend, pictogram speech				■			
	Information about flights/times	Video displays, variable message sign	Legend, numbers, pictures, symbols					■		
	Information about boarding	Sign, display, variable message sign	Legend, numbers, symbols					■		
		Airline/rail agents, attendants	Speech					■		
	Indication of boarding locations	Sign, display, variable message sign, agent	Legend, number, speech					■		
	Location	Sign, maps, guides	Legend, numbers, colours, illustration					■		
	Time	Variable message sign	Numbers (digital or analog clock)					■		
	Directions for departure/boarding	Loudspeaker, agent or attendant	Signs, sounds, speech					■		
Onboard	Instructions for travel and general comfort	Flight attendant	Speech						■	
		Signs/transparencies	Legend (with arrows), pictograms, colours						■	
	Instructions in case of emergency situations	Flight attendant, video, voice or loudspeaker	Speech							■
		Pocket brochure	Legend, illustrations colours, numbers							■
	Door operation and exit instructions	Sign/lights	Legend (with arrows), pictograms, colours							■
	Instructions for customs and immigration	Brochures, leaflets	Legend, numbers				■			

Planning Information Systems

In the planning stage of trip making, travellers need timely information on schedules, fares and reservations. All carriers providing scheduled service provide schedules that are listed in the Official Airline Guide. All major intercity carriers, including rail services, usually provide this information via published timetables and telephone reservationists (or in person at ticket offices and terminals). They may also provide it via a telecommunications device for the deaf (TDD) such as the 'visual ear'. In addition, personnel who serve the regular telephone lines are generally aware of the special needs of travellers with partial hearing or speech impairments. Key travel planning information may also be available in Braille, large print and/or audio cassette form for sight-impaired travellers.

All carriers have computer reservation systems (CRS) making information available to reservation personnel quickly. Airline reservations and payments can be made directly with the airline by telephone or at the airport, or through a travel agent. Both airline reservationists and travel agents can offer a variety of flight times and explain the many fares and their varying restrictions. The common air fares are first class, business class, economy, excursion, domestic charter class, family and ABC. Some fares are totally refundable and can be booked and changed at any time; other less expensive fares have varying restrictions about which travellers are advised to be aware.

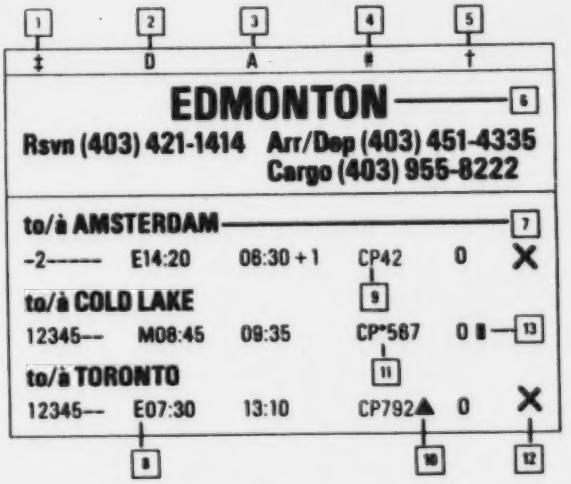
When purchasing a ticket, a written itinerary provided by most travel agents and airline reservationists usually includes a record locator or reservation number that can be quoted for reconfirming flights. If more than one airline is needed for a trip, the originating carrier will usually make all the reservations. The ticket, record locator and written itinerary will provide all the details of the trip. Some airlines permit passengers to preselect seats at the time of booking flights. In some cases, even boarding passes can be issued at the time of booking. The ticket contains coded information relating to the type of fare and passenger classification.

When the flight is being booked, the disabled passenger will normally inform the agent in order that the carrier will be aware of any special services required, and to determine whether or not there is a need for an attendant. Various classifications of disabilities according to the International Air Transport Association (IATA) are used. Based on these classifications, disabled passengers will be required to answer questions such as: Can you walk unaided? Can you ascend or descend steps? Will you need assistance during your flight with eating or personal care? Do you use and electric wheelchair? The answers to these questions will determine the type of assistance required during the trip for the traveller.

In the planning stage of the trip, therefore, the traveller has the option of looking up information for a specific trip in the published timetables or through personal or telephone contact with a travel agent or reservationist.

Timetable Information Systems. Essential to many travellers is the use of timetables. Virtually all major airlines and rail companies print their timetable as a standard size and with similar styles of information layout. The timetable is normally a long, narrow, little book crammed with schedules printed on very thin paper. Schedules are listed alphabetically under the names of departure cities. Most timetables will have information, usually at the back, about the airline itself, and perhaps a couple of seat plans to give some idea where to sit. Some airlines include a glossy, pull-out map of the world showing all the airline's destinations.

Exhibit 8: Timetable Information



1. **Frequency of Service** - Days of week that service is available. 1: Monday, 2: Tuesday, 3: Wednesday, 4: Thursday, 5: Friday, 6: Saturday, 7: Sunday.
2. **Departure Time** - Time of departure shown in 24 hour clock.
3. **Arrival Time** - Time at destination of anticipated arrival.
4. **Flight Number** - Airline carrier code and flight number
5. **Stops** - Number of stops or enroute connections.
6. **Departure City** - City of departure.
7. **Arrival City** - City of arrival.
8. **Airport Code** - Letter before time indicates airport of departure or arrival for cities served by more than one airport (e.g., Dorval or Mirabel).
9. **Special Classes** - Business Class available on all flights shown in red.
10. **Special Services** - Extra legroom (ELR) also in Canadian Class.
11. **Affiliated Airline** - Indicates Canadian Partner Flights.
12. **Services Available** - Meal or snack service or movie.
13. **Connections Available** - Indicates inter airport connections.

Having found your departure city, it will be followed by a list of possible destinations. Under Edmonton, Alberta, for example, the list will include all destinations from Edmonton. In order will follow the days of the week which the flight operates (either abbreviated or numbered 1-7). Then will

come local departure time, local arrival time (in 24-hour clock), the flight number and a note of the number of stops en route. The class of seats available may also be listed, together with the size of aircraft. Some timetables may say what meals are available in-flight, and also how long the journey should take.

Using a timetable is a relatively simple matter, although at first glance they can look alarmingly complicated. Using a timetable, one can quite easily make a detailed itinerary from the comfort of one's home. They usually, however, do not provide information on fares. Timetables change quite regularly and one always has to check to make sure the one being used is current. They are also of little value to the visually impaired.

Reservation Information Systems. While some travellers prefer to make their own arrangements directly with the carrier's reservationists, most seek the assistance of a qualified travel agent. Some travel agents are small, single-owner shops; the majority are part of large nationwide networks, such as Hagen's Travel or Marlin Travel. Travel agents who have CTC after their names are "Certified Travel Counsellors". Most CTCs have taken a course in travel counselling, passed a qualifying examination and worked in a travel agency for a set period of time. They are required to adhere to a code of conduct that specifies appropriate behaviour and responsibilities to the public, clients, other travel counsellors, employers and suppliers. A number of travel agents across the country specialize in making arrangements for disabled travellers.

Travel agencies are the retail arm of the travel trade. They act as agents of the numerous tour operators and are in the business purely and simply to sell these operators' tickets and holidays. Precisely what each agency sells varies but most emphasize that they are selective and deal only with airlines and operators whom they believe offer good service. Travel agents make their living on the commission they earn from selling all the forms of package holidays and travel tickets they can offer. For each booking, they make a specific commission, normally around 9 percent on the average scheduled airline ticket. Most types of tickets do not cost any less to the customer even if you buy them direct from the airline company.

As well as being able to offer sound advice about which ticket would best suit the traveller's needs, reputable travel agents should be able to offer a range of other services as well. Among other things, the agent should be able to organize the following: adequate insurance to cover a specific trip; advice about passports and visas; hotel bookings and car-hire arrangements; and foreign currency and traveller's cheques. There is a wide variation in advice offered by travel agents, however, and it is worthwhile to check out a few. In asking questions of travel agents, there is usually a wide variation between questions from the frequent traveller and the casual traveller. Some travel agencies, such as Handi-Travel in Toronto, Keroul in Montreal, Westernlund in Ottawa, and Pavlik in Vancouver specialize in arranging travel for passengers with disabilities.

Terminal Information Systems

All major terminals have a standard range of services and facilities to accommodate the needs of every type and class of traveller, as well as the rapid daily turnaround of transportation staff and the thousands of people who flock constantly to airports to meet, or say goodbye, to travellers.

Terminals are the interchange points between all air (or rail) services, and the point of connection between every mode of surface travel -- bus services, taxi operators, tour coaches and the private car. Terminals are also businesses which must function efficiently and effectively for all those who come into contract with them. They contain all kinds of services for the public including retail, food services, washroom, currency exchange, banking, nursery, and so forth.

Many airport terminals will have separate buildings or areas for domestic and international flights. Also, many airports will have separate areas for departures and arrivals. Another important division in airports is that between the general (non-travelling) public and air travellers, whether coming or going. The air and landward areas of a terminal are normally divided by Security Control (for departures) and Customs or Baggage Control (for arrivals).

Exhibit 9: An Airport Terminal

Ottawa

Information that is provided to passengers in general by the carrier at the terminal or on the vehicle concerns ticketing, gate assignments (e.g., the gates for various outgoing flights at a hub airport that passengers on an incoming flight will have to connect with), delays, baggage claim, etc. This information has to be provided in a timely fashion in a manner usable by all persons, including those with sensory disabilities.

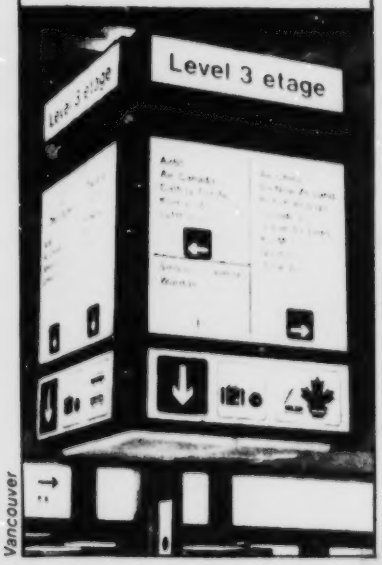
Orientation Information Systems. In general, terminal information systems take into consideration the needs of disabled persons. The primary information mode is visual words or letters, or symbols, using lighting and colour coding. Terminals also have facilities for providing information orally through public address systems.

Exhibit 10: Orientation Display

Vancouver

The extent to which technological aids are most appropriate to meet the information and communication needs of the disabled within terminals is a function of the size of the terminal and the level of activity which the terminal supports. In smaller terminals with limited numbers of arrivals and departures, personal assistance supplemented with audio announcements and changeable signs appears to be most appropriate. In larger terminals, where size and number of arrivals and departures make it increasingly difficult to convey complete audio and visual information to the general public, technological aids have a place in enhancing the personal assistance which would be available to many disabled travellers.

Exhibit 11: Signage



Vancouver

In particular, aids which would allow travellers with partial sight, hearing or speech impairments to function independently may be very effective in reducing or eliminating obstacles to travel for a large segment of the communication-impaired population. Improved signage, in terms of both design and content, and loop systems in common waiting areas that would allow hearing aid users to better understand public address announcements, such as the one available at Heathrow Airport, are two effective improvements which could meet the information needs of partially impaired travellers. It is important that the loop system be designed to transmit messages with a high degree of clarity and that visual signs be provided to indicate that the room is 'looped' and that a message is being broadcast. Other systems that offer promise include: Communicaid, a system of integrated communication aids for person with sight, speech, or

hearing impairments; and Transaid, a portable communication and translation device (32,36). Personal assistance, however, appears to be the most effective and flexible approach for meeting the needs of travellers with profound sight, hearing or speech impairments in the short term.

Procedural Information Systems. The check-in desk for passengers and their luggage will have the name of the airline above it. In most cases, it will also have the flight number as well. When you arrive at the airport, presenting yourself at the appropriate check-in desk is the immediate thing to do. The first page of your ticket will be torn off and you will be handed a boarding pass. At check-in, the seat number and departure gate are printed on the boarding passed. Luggage intended to be carried in the hold will be weighed and labelled -- and you will be given a tiny receipt which you must retain until you see your luggage again.

Exhibit 12: Airport Check-in Counter

The most reliable information about flights can be obtained from the check-in counter of the relevant carrier. In addition, transfer passengers can get up-to-date information from the Transfer Passenger Desk. This is located in the transfer waiting lounge, or nearby, and as its name implies it is specifically for the assistance of transfer passengers. All major terminals will also have Information Desks providing information. The desks offer details and advice concerning the airport, such as the location of accessible washrooms or the nearest phones, and/or tourist information. Information desks do not usually provide flight information. That can best be obtained from airline desks themselves, or the flight information video displays that will be dotted around the terminal.

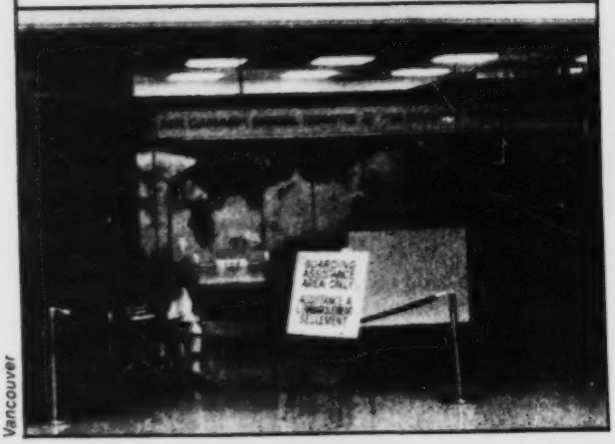
Exhibit 13: VIA Rail Ticket Counter

Montreal

Exhibit 14: VIA Rail Information Desk

Montreal

Exhibit 15: Air Canada Special Services



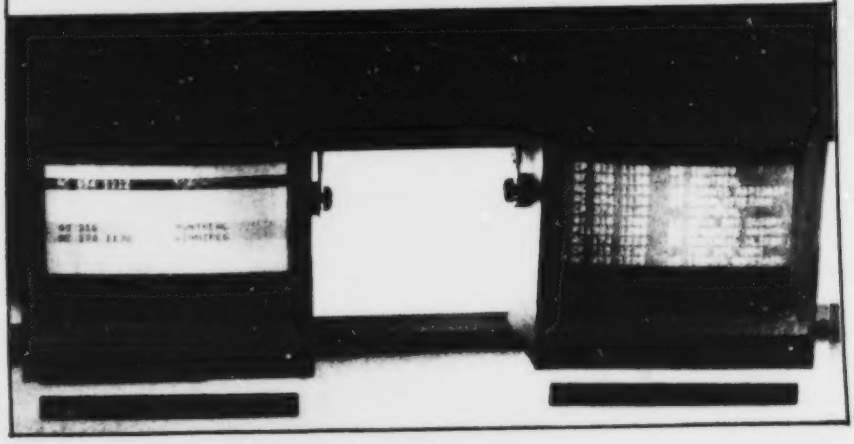
Vancouver

Some airlines have provided special boarding assistance areas for disabled travellers as seen in the photograph opposite. Disabled travellers who wish assistance to the gates may obtain it here. All airline and rail carriers, although they may not have special designated areas to do so, provide individual help to disabled travellers with trained personnel. Some disabled travellers have expressed a desire not to be segregated from regular travellers in this way.

Directional Information Systems. One of the most striking features of any major terminal is the flight destination board. This is one of the permanent facilities available to passengers and a constantly changing source of information about comings and goings of all flights.

In many cases, a single electronically controlled flipboard in the center of the terminal will be complemented by a number of television monitors all around. In the more advance information systems, the monitors and flip-boards will be linked to a central airport computer to ensure that all the given information is as up-to-date and accurate as possible. There is also a parallel series of monitors -- generally unseen by terminal users -- which display identical information through the working areas of the airport.

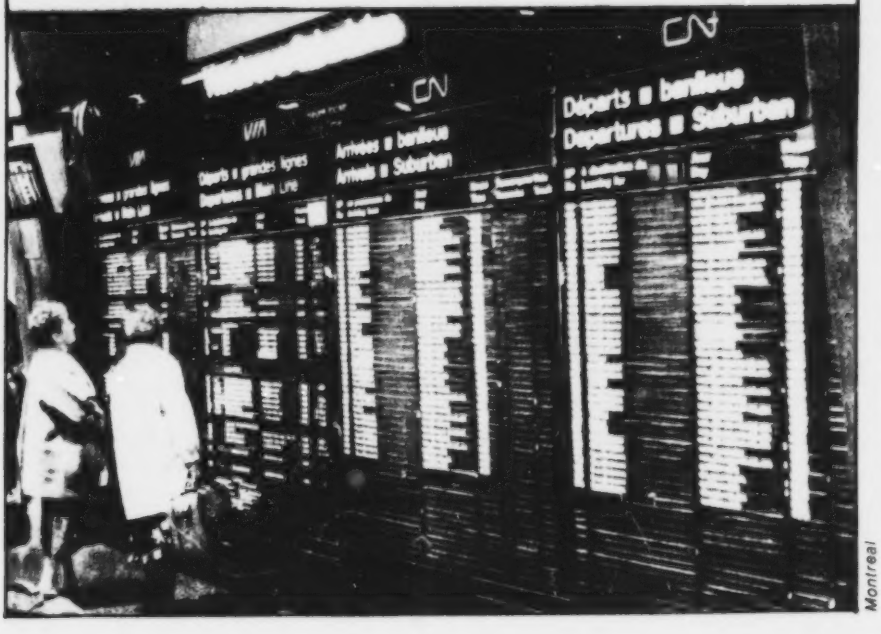
Exhibit 16: Airline Flight Destination Screens



Ottawa

The Flight Destination Board will show all flight departure times, as well as the relevant gate numbers, cancellation information and any other immediate information essential to your trip. The lettering used on all airport boards will be scientifically researched for clarity and easy reading.

Exhibit 17: VIA Rail Service Board



Montreal

On-board Information Systems

On-board information systems are provided by carriers to provide information on emergency procedures and enroute services that may be provided for the passengers. Although seat pocket information cards and enroute magazines are generally provided, the main source of on-board information is the flight attendants or crew of the vehicle. Usually this information is verbal, either in person or through the on-board public address system. Communicating with the crew may be difficult with certain travellers with sensory or cognitive disabilities.

A combination of audio and visual announcements and an awareness of the needs of communication-impaired travellers by carrier personnel is required during the on-board element of a trip. Public address systems, variable or electronic message signs and, in certain applications, loop systems are technologies which may be appropriate for implementation.

Video systems, however, seem to be the preferred technology of the airlines and the most flexible means of communication. If this is the preferred solution, the problem then is to adapt the video systems and

their content for open or closed captioning. Open captioning is the practice of putting written 'subtitles' on the video tape so that persons with hearing impairments can read a transcript of the dialogue (closed captioning -- using decoders so that the captioning only appears on selected screens -- does not appear to be feasible). It would also be advantageous for all passengers if all in-flight messages (i.e. public address announcements) could be displayed on the video screens in text format.

Service Information Systems. The crew on board every aircraft is always headed by the Captain who has absolute responsibility for passengers and the aircraft. The Co-pilot shares flying duties with the Captain. The Flight Engineer feeds technical information to the pilots. Flight Attendants look after the needs of the passengers.

At certain times in a flight (e.g., takeoff and landing), flight crews have certain duties mandated by Transport Canada regulations. For example, flight attendants are required, prior to landing, to ensure that carry-on luggage is stowed in appropriate places and that seat backs and tray tables are in their full upright positions. In Corridor Service, Via Rail personnel have available a card containing limited information on signing in order to communicate with those disabled travellers who use signing. Airlines could encourage a similar approach or use pre-printed cards to outline services.

Emergency Information Systems. The need to provide vehicle orientation and safety information to all passengers is an important aspect. Each airline is responsible for designing their briefing and choosing the means to deliver it -- live demonstration or video, with or without open captioning or closed captioning, possibly augmented by Braille seat pocket information cards and tactile orientation diagrams.

Oral briefings are given prior to takeoff and usually consist of information on oxygen masks, seat belts, briefing cards and the location of emergency exits. In many cases, the oral briefings are given live; one flight attendant recites the information over the public address system, while the other flight attendants in the aisle demonstrate certain actions in concert with the oral briefings. The visual information is useful for persons with hearing impairments and the verbal information is useful to persons with visual impairments. Air Canada developed a safety video with a highly 'visual' message (that is, one that does not require any supporting script) and successfully tested it with various individuals with hearing impairments.

A serious problem exists regarding cabin briefings (8, 9) in that the demonstrations are neither capturing nor holding the attention of the passengers. In general, passengers don't listen to the live demonstration, watch the video, read the seat back cards (including the braille version) or inspect the exit locations. Whether the passengers don't want to recognize the risks inherent in any travel or they have a high degree of faith in the security of air travel, a major problem exits in informing the passengers about airplane safety features and procedures.

INDUSTRY PRACTICES

This section presents the current policies, practices and plans of major inter-city air and rail carriers with respect to travellers with sight, speech and hearing disabilities at all stages of the journey. In addition, the plans of the carriers for testing or implementing any improvements in the near future are identified.

Air Carrier Practices

The major airlines in Canada include: Air Canada, Canadian Airlines and Wardair. Six airlines make up the Air Canada Connector Network: Air Alliance, Air BC, Air Ontario, Air Nova, Air Toronto and NWT Air. Canadian Partners form the feeder link for Canadian Airlines, with five carriers participating: Air Atlantic, Calm Air, Inter-Canadian, Ontario Express and Time Air. Wardair's situation is somewhat different. A late starter in the scheduled airline business, the company does not have the kind of unified feeders that the other have built.

All the major airlines have a formalized training program for ground and cabin personnel. The program usually stresses the understanding of disabled travellers' special needs. It may be given as part of the normal training for personnel or it may be provided as a separate sensitivity program. Part of the program includes instructions to eliminate unnecessary strain and accidents to airline personnel when transferring people in the terminal and aircraft cabins. The airlines, however, lack a formal policy for handling the needs of travellers who are cognitively-impaired.

A major barrier to cognitively and communication-impaired travellers is often a lack of understanding by non-impaired persons. The airlines, recognizing this fact, have ongoing formal training procedures to better inform their staff of the special needs of the travellers with different disabilities. The programs include films, demonstrations, lectures by individuals with different types of disabilities as well as practical experience in the field.

For trip planning purposes, most airlines provide printed schedules and telephone reservations. Reservations may also be made at the airlines ticket office or through a travel agent. Passengers are requested to make any special requests for pre-boarding and deplaning assistance, escort assistance, special diet or an airline wheelchair at the time of making the reservation. Air Canada has a TDD for reservations.

When making the reservation, it is the traveller's responsibility to inform the airline of special services required. The ticket agent will need to "classify" the traveller's disability in order to ensure the particular aircraft's numerical restrictions are being met and that the airline will be aware of any special services required, and to determine where or not there is a need for an attendant.

Due to inconsistencies among the airlines in making assessments on the carriage of disabled passengers, the International Air Transport Association (IATA) has compiled a booklet called "Incapacitated Passengers Handling Guide" (January 1981) with recommendations for IATA member airlines. The following IATA definitions are used by airline representatives to ascertain which category, in terms of each individual's physical capabilities and requirements for special services, passengers with disabilities fit into:

WCHR -- R for ramp: This classification includes persons who are ambulatory, that is they can walk; board the aircraft unassisted (even if slowly) with walking aids; and move about within the aircraft cabin unassisted. Wheelchair assistance may be required for long distances, i.e. across ramps as applicable. Blind, deaf and mentally handicapped persons are usually included in this category. Elderly people requiring minimal assistance, such as the use of a wheelchair for distances, are also included in this category. WCHR passengers are considered self-reliant unless a serious medical condition exists. No restrictions are imposed by Canadian airlines on the number allowed on each flight.

WCHS -- S for steps: Persons classified as WCHS cannot ascend/descend steps but are able to make their way to and from cabin seats. A wheelchair is required to help them to and from the aircraft and they must be carried up and down stairs. They are considered self-reliant unless a serious medical condition exists. No restrictions are imposed by Canadian airlines on the number of WCHS passengers allowed on each flight.

WCHC -- C for cabin seat: These passengers are immobile; they require a wheelchair to and from the aircraft, and must be carried up and down steps and to and from the cabin seat and toilet, and need assistance to take care of their physical needs in-flight. They are considered non-self-reliant and require a personal attendant. In Canada, on certain airlines, the attendant's fare will be reduced.

WCHP -- P for paraplegic: This is a strictly Canadian classification, referring to a passenger who is immobile but self-reliant during a flight. A wheelchair is required to and from the aircraft, and the person must be carried up and down steps and to and from the cabin seat. This passenger is capable of taking care of all physical needs in flight. He or she will have taken precautions to avoid the necessity using the aircraft washrooms and requires no special attention, except on boarding or deplaning, beyond that afforded to the general public. This passenger may travel without a personal attendant in accordance with approved numerical restrictions.

Once the passenger is "classified" in this way, the information is stored in the computer where it can be easily accessed. The day before the intended service, an airline service supervisor will check the passenger lists at the airport to note which passengers may require special services. The information is also available to the ticket agents and the boarding agents in the departure lounge.

At check-in, the seat number and departure gate are printed on a boarding pass and the balance of the ticket is returned to the passenger. Depending on the passenger's needs, they may be directed to a special area which is designated for passengers needing assistance to board the aircraft. When the time is right, an attendant will escort these passengers through security and to the boarding area.

Travellers with disabilities are usually pre-boarded and given individual instructions on safety procedures and layout of on-board facilities. The airlines are also taking actions to increase access to travellers with disabilities by such improvements as installing removable arm rests at selected seat locations and providing more accessible washrooms.

Passengers in wheelchairs: If there is a jetway to board the plane from the gate, the passenger will be taken as far as possible in their own wheelchair. The normal procedure is to transfer the passenger from their wheelchair to the aisle chair at the door of the plane. The passenger's wheelchair will then be taken down to the baggage hold of the plane, where it will be extracted for the passenger's arrival.

Passengers with canes: At one time, all crutches and canes had to be stored away once the disabled passengers was seated, but now some of those aids may be stored under the passenger's seat, providing that they don't protrude into the aisle or into the emergency exit passage.

Visually-impaired passengers: Passengers with visual impairments are alerted by the public address system to the lighted signals for "fasten seat belts" and the attendant will explain the layout of the aircraft and the location of call buttons, for instance.

Hearing-impaired passengers: Hearing-impaired passengers can read emergency procedures in instruction sheets available at each seat.

Passengers with guide dogs: Guide and hearing dogs are allowed to travel on board free of charge with their owners. It is usual for a window seat to be assigned so that the dog is not in the way of other passengers.

Since the airlines share the terminal facilities, differences in the services provided to travellers with disabilities are often related to the terminal and not the carrier. International terminals are generally well equipped with facilities for disabled passengers. Elevators, and at least one or two adapted rest rooms, accessible to wheelchairs, can usually be taken for granted in the large airports. Lowered and amplified phones are found in many terminal buildings. Telephone devices for the deaf (TDD) are usually available but may be difficult to locate. Airport information maps are provided. Information booths are staffed and there is usually ample signage and pictograms. In the larger terminals, video monitors are used to display arrivals and departures, while in smaller terminals display boards are more commonly used.

VIA Rail Practices

Over the last several years, VIA Rail Canada has made considerable progress in improving the services offered in their stations and aboard their trains. VIA's range of special services, however, varies across Canada according to the markets served and the type of equipment used. The major components of VIA's program for persons with disabilities include:

- an educational program in which VIA's front-line personnel undergo sensitivity and awareness training, and learn "hands-on" techniques for assisting special needs travellers based on the theme, "May I Help You? How?" VIA recognizes that the traveller is the authority on his or her disability and consequently front-line staff are trained to ask how they can best provide assistance;
- the waiving of basic fares for required personal attendants since VIA personnel are not responsible for medical or related services, or personal care such as assistance inside the washroom and feeding.
- RESERVIA, VIA's computerized and centralized reservation system, which can be accessed by a telephone device for the deaf (TDD), also used by speech-impaired travellers;
- manual lifting on/off trains where mechanical lifts are not available, and where sufficient personnel is on hand.

A minimum of 24 hours advance notice is requested to ensure that special needs are met on trains operating in the Quebec-Windsor Corridor. On transcontinental and other services, a minimum of 48 hours notice is requested. Via Rail requests that passengers explain their special needs when the reservation is made. This allows them to confirm the availability of the service required. The traveller's ticket will show that a Special Service Request (SSR) has been issued.

If advance boarding is required, VIA Rail requests the traveller to arrive at the station at least one hour before the scheduled departure time, and to notify the station staff that boarding assistance has been requested. If assistance is needed, pre-boarding is arranged and an on-board attendant guides the traveller directly to the seat and provides a description of all coach facilities. All new staff, through their managers, are offered formal training to deal with special needs of travellers with disabilities. A small card illustrating some basic sign language is currently available to staff on request and VIA has noted a demand for this card on Corridor Services (note: Corridor Services are those VIA Rail services operating between the cities of Quebec, Montreal, Ottawa, Kingston, Toronto, London, Windsor, Hamilton, and Niagara Falls in eastern Ontario and Quebec).

The major terminals have a red-cap service to meet travellers upon arrival. They are available to handle baggage and escort travellers directly to the ticket agent or information booth depending upon the needs. Verbal announcements as well as arrival and departure displays provide clear instructions for most travellers.

Exhibit 18: Current Industry Practices -- Information Systems

INFORMATION/CARRIER	AIR CANADA	CANADIAN AIRLINES	WARDAIR
Planning Information	- printed schedules - newspaper ads - telewriters (TDD'S) - reservation clerks - travel agencies - connection to travel agency with visual ear - airline information in airport terminals - brochure on services for special needs	- printed schedules - newspaper ads - reservation clerks - travel agencies - connection to a travel agency with visual ear - airline information in airport terminals	- printed schedules - newspaper ads - reservation clerks - travel agencies - connection to a travel agency with visual ear - airline information in airport terminals
Terminal Information	- "How may I help you" assistance program - floating personnel to provide information - video flight arrival and departure boards - special services area in some airports - escort service from contact to boarding with wheelchair - preboarding assistance - verbal announcements	- "How may I help you" assistance program - floating personnel to provide information - video flight arrival and departure boards - escort service from contact to boarding - preboarding assistance - verbal announcements	- "How may I help you" assistance program - floating personnel to provide information - flight arrival and departure boards - escort service from contact to boarding - preboarding assistance - verbal announcements
On-Board Information	- special 'visual' video safety procedures - printed safety and instruction cards - personal attention and guide to facilities - tactile information of plane facilities - floor emergency lights and exit signage - section in magazine	- verbal instruction on safety procedures - printed safety and instruction cards - personal attention and guide to facilities - emergency exit systems are signed and there are floor running lights	- verbal instruction on safety procedures - printed safety and instruction cards - personal attention and guide to facilities - emergency exit systems are signed
Human Services/Training	- formal training - field experience - basic training includes how to recognize and assist the disabled - lectures by representatives from the disabled community - floating ground personnel to assist passengers	- formal training - field experience - some training to assist disabled persons (e.g. to move passengers in wheelchairs) - some hand signals	- formal training - field experience - some training to assist disabled persons (e.g. to move passengers in wheelchairs) - some hand signals
Improvement Plans	- in touch with disabled organizations to improve service to disabled travellers - continuous upgrading of personnel	- Braille safety card instructions - plane tactile guide information - key terminal personnel to learn sign language	- general improvements to make WardAir policies the same as Canadian Airlines

VIA RAIL	BC RAIL	ONTARIO NORTHLAND	TRANSPORT CANADA
- printed schedules - newspaper ads - visual ear available for information and reservations - information counters in some terminals - pamphlet for special needs passengers	- printed schedules - newspaper ads - phone listings - information booth at rail station	- printed schedules - newspaper ads - phone information - information booth at railway stations	- publication of guide: "Transportation in Canada: A Guide for Travellers with Special Needs" (TP 380) - funding of resource book: "Handi-Travel" - several studies on needs of travellers with disabilities and possible solutions
- assistance in major stations with baggage, tickets and boarding - redcap at some major stations will assist - amplifier telephones - large text arrival and departure boards and video monitors in Montreal and Toronto - verbal announcements with improved PA in Montreal in 1988 - information counters in some terminals	- special assistance from personnel - information booth at rail station - pen and paper - verbal announcements - redcap at front door	- special assistance from personnel - information booth at railway stations - verbal announcements	- information booths in international airports - colour-coded parking and disabled parking at some terminals - signage at terminal access points - pictograms, surface textures at terminals - volume control phones at all terminals - testing of integrated communication system, Communicaid and portable system, Transaid
- personal help when can with baggage and washroom locations - preferential seating and assistance for wheelchair travellers and groups - provision of card with basic sign language - emergency exit systems are signed	- personal attention - pen and paper	- special assistance from personnel	- dissemination of information on safety cards, etc. - Safety Branch is looking at new package to disseminate information to persons with disabilities
- formal training procedures for front-line staff (with people with disabilities) - participation in workshops to deal with specific needs of disabled travellers	- formal training - field experience	- formal training - field experience	- publication of airport design standards - training of information booth personnel
- special needs pamphlet to be produced on tape casette - ongoing informal relationships with associations	- none at present	- general improvements	- structural changes at terminals - consideration of recommendations from studies by CNIB and association for deaf

VIA offers a wide range of special services in terminals and on board trains; but, passengers unable to provide for their personal needs are strongly encouraged to travel with an escort. VIA's policy allows the escort complimentary coach accommodation -- a "two-for-one" fare. Persons who are physically disabled can obtain an identification card for escorts from the Canadian Rehabilitation Council for the Disabled (CRCD), persons who are visually-impaired can use the CNIB National I.D. Card, and persons who are mentally retarded can obtain eligibility forms from provincial organizations for mentally retarded people.

VIA publishes a brochure entitled, "Special Services Offered by VIA Rail Canada" to describe the services provided. The brochure is also available on a tape cassette for persons who are visually-impaired. The brochure was printed in braille at one time; but, there was such a small demand that this practice was discontinued.

The following services and suggestions are provided by VIA Rail for travellers with disabilities:

Passengers with allergies: Passengers with allergies or respiratory difficulties will, upon request, be seated in non-smoking areas of the train. Non-allergenic pillows are available in sleeping accommodation.

Passengers with guide dogs: Visually-impaired or hearing-impaired passengers with harnessed guide dogs will be seated on the train to ensure their maximum comfort and that of other passengers. On trains with sleeping accommodation, a passenger who has reserved an upper berth and is travelling with a guide dog will be offered a roomette at no extra charge, subject to availability.

Visually-impaired passengers: For information, such as details of daily menus and services available on board and in stations, passengers with visual impairments should request assistance from VIA personnel. A brochure is available on tape cassette on special services.

Foreign language passengers: Passengers incapable of communicating in either English or French should carry written instructions in one of these languages outlining details of their itinerary and other attention required.

Mentally disabled passengers: Mentally disabled passengers who are self-reliant and who may need even minimal assistance should advise VIA at the time their reservation is made. Mentally disabled passengers who are not self-reliant must advise VIA of their needs in advance and be accompanied by an escort familiar with their requirements.

Passengers requiring special meals: Special diet and meal service can be arranged in advance for passengers on vegetarian, low-salt or other restricted diets. A minimum of 24 to 48 hours' advance notice, depending on the rail service being used.

Passengers requiring an escort: Passengers requiring assistance in tending to their personal needs during their trip are requested to travel with an escort capable of providing this assistance. The escort is offered free coach accommodation. To make use of this option, passengers must carry a medical certificate or present a card from one of the associations recognized by VIA. The escort is expected to assist in entraining and detraining and transferring.

Passengers with respirators: Passengers requiring oxygen during their trip are asked to provide their own equipment on the train. With 48 hours' advance notice, VIA will provide voltage regulators on certain trains.

Speech or hearing-impaired passengers: Easy access to reservations and other information is available by linking a home teletype directly to VIA's reservations network, to send or receive reservation and information messages. Certain VIA stations are provided with a telecommunications device for the deaf (TDD), available at the information counter. Speech-impaired passengers are requested to carry written instructions to advise both on-train and station personnel of their itinerary, connections and requirements. Hearing-impaired passengers are requested to identify themselves to VIA personnel so they may be kept informed of schedule changes and their arrival at destination.

Passengers in wheelchairs: Passengers in wheelchairs can be boarded with the use of a station-based wheelchair lift (where available) or with assistance from VIA personnel, on transcontinental trains. On some routes, passengers in wheelchairs must provide their own assistance for entraining and detraining. VIA offers a variety of on-train services. On LRC first class cars in the Quebec-Windsor Corridor, a wheelchair tie-down is available along with an accessible washroom. Conventional trains are not yet equipped with wheelchair tie-downs or accessible washrooms.

VIA Rail continues to invest in employee training, as well as in techniques and equipment to enhance services for passengers with special needs. They have a continuing, informal dialogue and consultation with agencies and organizations of disabled persons.

INFORMATION IMPLICATIONS

This review of information and communication systems to the function of providing information for travellers may give the impression of extreme diversity and singular accomplishments. This would be misleading. Any individual system cannot be divorced from another.

The systems used for conveying information to users are really multiple technologies, since they complement each other, and an investment in one system often leads to additional commitments and benefits in others. Each system can show widespread 'ripple' effects throughout the industry.

The requirement in transportation operations for more information, particularly information of a highly complex nature, has created a demand that has effectively complemented the technical push evolving from accelerating developments in technology. The demand is evident and the technical capabilities are considerable. The new catchword may well be **augmentative systems** for information: such systems as Quantas Airways' individual passenger video display terminals, the Airshow 100 passenger information and entertainment system, and the Agses passenger entertainment system by Trans Com Systems. These systems are capable of providing complimentary visual and auditory information.

Exhibit 19: On-Board Entertainment/Information System

The real issues affecting the application of information technology are not technical, but institutional and, to some extent, economic. Information systems that have benefited from the incorporation of new technology have done so not because of the exciting technical aspects involved, but because of the benefits they appear to offer. The major reasons for adopting these new technologies are related to economics: the enhanced system capability; the potential for manpower savings; and the quality of the information provided. The systems provide vital and timely information to the users. They aid users in reducing uncertainty. Although the systems are justified on economic grounds, we must recognize that it is difficult to quantify the benefits, especially since they are just beginning to be understood.

5. SYSTEMS ASSESSMENT

There are three main groups who rely on the information provided by a travel information system: the traveller, the travel agent, and the carrier personnel. To meet the needs of the traveller with disabilities and to ensure a trouble-free journey, information has to flow back and forth between these groups -- not only in the planning stage of the trip but also during the trip itself, and especially if changes in travel arrangements should happen to occur during the trip.

There are two major components which determine the relative ease with which a voyage is completed: (1) the amount of knowledge that the traveller has prior to departure, and (2) the knowledge of the carrier personnel with respect to the special needs of the traveller. The more information that the traveller with disabilities can obtain before the trip, the better they are in making departure, connecting and arrival decisions.

In essence, the disabled traveller needs to plan (determine appropriate travel times, know the physical limitations of the aircraft or train, make reservations), be familiar with the terminal (special parking areas, terminal access, orientation within terminal, knowledge of procedural flight information) and adhere to the necessary flight regulations onboard (access to procedural and emergency information, layout of the aircraft or train).

The air or rail carrier personnel need to know the limitations of the individual and the need for any special equipment or services. Furthermore, the carrier personnel should make the traveller with disabilities aware of any restrictions that need to be complied with. Therefore, both the traveller and the carrier need to ask questions in order to ensure a smooth journey for the traveller with disabilities.

A wide array of traveller information systems exist: from printed materials to phone communications including auditory and visual public address systems, and carrier personal assistance. To determine whether additional systems need to be developed, it is necessary to determine how well the existing systems meet the needs of the traveller with disabilities.

It is critical, when assessing information systems, to understand if they are useful (Will it do what is needed functionally?), useable (Will the users actually use it successfully?), and likeable (Will the users find it pleasant to use?). In developing traveller information systems, it is necessary not only to consider the needs of the able-bodied traveller but also those of the traveller with disabilities.

METHOD OF ASSESSMENT

Four groups of individuals with disabilities were selected for this study: physically-disabled travellers, visually-disabled travellers, hearing-disabled travellers, and cognitively-disabled travellers. By contacting different associations for the disabled, individuals with travel experience were selected based on a pre-screening interview. To participate, individuals had to have travelled in a non-group situation by air or by rail in Canada during the past 18 months. Travel companions were also invited to participate providing that they had travelled with the disabled individual in the past 18 months.

Care was taken to ensure that persons with varying degrees of disability were represented within each group (i.e. a respiratory dependant wheelchair traveller and a manual wheelchair traveller; a totally blind traveller and a partially-sighted traveller, etc.) For the cognitively-disabled group, persons with learning disabilities were selected due to the diversity of this group and the anticipated problems of soliciting information from persons with emotional or psychiatric difficulties. Care was taken to find travellers with dyslexia, direction-finding problems and time-comprehension problems. Two groups of travellers that were not included study were: illiterate individuals or individuals unable to speak English.

Focus Group Sessions. To avoid the difficulties encountered completing a questionnaire and to provide a means of soliciting 'real-world' information, four focus group sessions (one for each of the disabilities) were conducted. In these sessions, travellers were given an opportunity to discuss their travel experiences and ideas in a group stiuation. The intent of the focus group sessions was (1) to identify whether travellers with disabilities had information needs beyond those of the general public, and (2) to document the particular difficulties experienced by travellers with disabilities. The discussions centered on problems encountered while planning a trip, making reservations, travelling within the terminal, boarding the vehicle and making use of the services. The focus group discussion sessions were video and audiotaped and transcribed for analysis.

Travel Simulations. To assess the qualities of existing travel information systems, simulated travel scenarios were undertaken with three volunteers from each of the four disability groups. Three different travel destinations departing from Vancouver were used: Comox, Grand Prairie and Chicago. These routes were chosen to assess the knowledge of the airline reservation agents for different travel scenarios including: small aircraft arriving at a small airport (Comox), a domestic flight with a transfer (Grande Prairie), and an American flight (Chicago) with a flight change within Canada so that the procedures for dealing with customs, and crossing the border, could be evaluated. Presentation of simulation routes and information requirements are outlined in Appendix D.

A simulation started with a traveller making a phone reservation while being monitored by a researcher. The traveller was asked to indicate to the agent their disability and the preferred travel route and times. It was hypothesized that the reservation agent would initiate a series of questions. If this did not occur, the caller used a list of prepared questions which they would have normally asked before making a particular flight decision. By listening to the conversation, the researcher could document the information passed between the agent and traveller to determine who initiated each question and to verify the accuracy of the response. The researcher also noted whether traveller-initiated questions were answered immediately or were delayed, and whether the agent was uncertain or unaware of the answer. The total time to complete the reservation was noted, as was the number of times the caller was put on hold. After the reservation was made, the participants were asked to rate both the service provided, and the agent's knowledge of the traveller's special needs.

To validate the reservation information, the traveller was asked to proceed to the airport on the day of departure, to check-in and go to the gate, with or without airline assistance as they would normally. Researchers observed the process from a distance to identify difficulties. Airline personnel were not aware of the simulations until pre-boarding when they were advised that the participants were not travelling on the flight. The participants were then debriefed as to their experiences, and their comments were noted. Travellers were asked to give particular attention to the service provided by the airline, ease of mobility around the airport, and difficulty getting through security. They were then asked to rate their experiences in these areas. Participants were also asked to give their comments on various information services around the airport including emergency procedure maps, flight information video terminals, and the airport map. The match between the reservation information which the traveller received over the phone and the actual experience at the airport were subsequently assessed.

The rail travel information systems were assessed in the same manner as for the airlines. Only one traveller from each disability group was involved, however, due to time constraints. The Vancouver rail station general information systems were also visually assessed by an ergonomist.

SYSTEMS ASSESSMENT RESULTS

The results of this study were analyzed for the entire group of travellers with disabilities as well as for each individual disability group. Objective data results will be reported in this section. At this point, it is necessary to caution the reader that the findings are qualitative, not quantitative in nature. The study was designed to explore how respondents feel and behave rather than to determine how many think or act in a specific way. Therefore, the findings cannot serve as a basis for statistical generalizations, but should instead be viewed as working hypotheses, subject to quantitative validation.

Twelve travellers participated in the simulation section of the study, three from each group of: physically-disabled, visually-disabled, hearing-disabled, and learning-disabled. Results for air travel are analyzed under five general categories: (1) flight travel arrangements, (2) check-in at the airport, (3) mobility through the airport, (4) getting through security, and (5) general information systems, including video terminals, airport maps, signage and safety cards. The results for rail travel are analyzed under: (1) rail travel arrangements, (2) checking in at the terminal, (3) on-board the train, and (4) terminal information systems.

Airline Information Systems

Flight Travel Arrangements. Flight reservation procedures were assessed for 9 of the 12 travellers. It was determined from the focus group sessions that the travellers with learning disabilities generally do not experience problems making reservations but rather negotiating their way through the airport. Hence, the flight reservations procedures for travellers with learning disabilities were not evaluated. In making the ticket reservations, 76 percent of the questions asked during the reservation process were initiated by the traveller and 24 percent were initiated by the airline agent.

Of the questions initiated by the traveller, 73 percent were answered immediately and 14 percent of the answers were delayed. In 12 percent of the questions, the agent was uncertain and in one percent the agents changed their initial answer later in the conversation (Exhibit 20). The mean time to make a reservation was 18 minutes 46 seconds (sd 5:28). The caller was put on hold on average 1.2 times per call.

When asked to rate the overall service given by the agent (excellent to poor), four travellers felt that the service was excellent. Two of these were visually impaired, one physically impaired and one hearing impaired. Three thought that the service was good, including one hearing-impaired and two physically-impaired travellers. One traveller with a visual impairment thought the service was adequate, and one traveller with a hearing impairment thought it was poor.

Exhibit 20: Response to Reservation Needs

Percentage of questions initiated by traveller which were answered immediately, delayed uncertain or the answer was changed

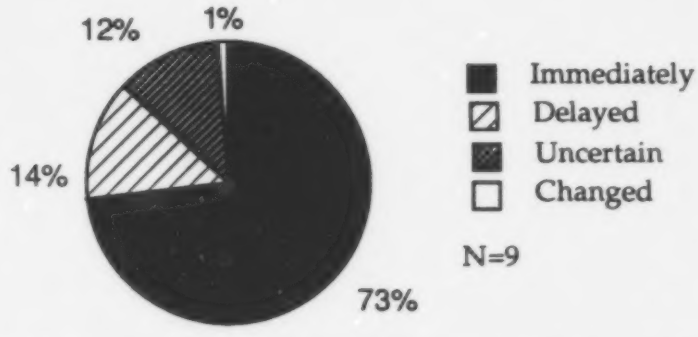


Exhibit 21: Rating of Overall Service

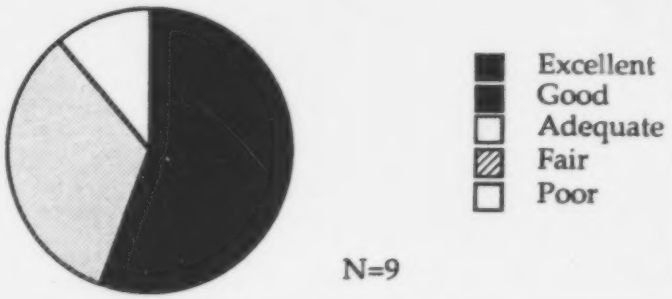
"Rate the overall service given by the agent"

Of all the questions initiated by the traveller, 93 percent were answered correctly and 7 percent were answered incorrectly. For 45 questions out of 60 (75 percent), travellers found that the information given to them when making the reservation was the same as experienced at the airport. For 25 percent of the questions there was a discrepancy between what they were told by the airline agent and what was experienced.

When asked to rate the overall knowledge of the agent for travelling with their disability, one traveller with visual disabilities rated it excellent, two with visual, one with hearing and one with physical disabilities rated it good; one with hearing and two with physical disabilities rated it adequate, and one traveller with hearing disabilities rated it poor (Exhibit 22).

Exhibit 22: Rating of Agents' Knowledge

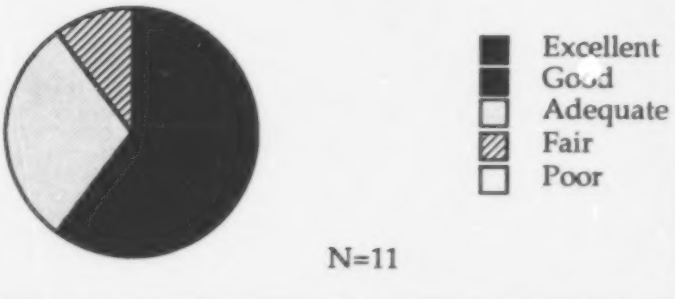
"Rate the knowledge of the agent for travelling with your disablity"



Check-In at the Airport. All participants were asked to rate the overall service of the airline agent at the airport while picking up the ticket. One person felt that the service was excellent; this was a traveller with a visual impairment. Six participants, including one with learning disabilities, two travellers with hearing and three with physical disabilities felt that the service was good. One with visual and two with learning disabilities felt that the service was adequate and one with hearing impairment felt it was fair (Exhibit 23). One person with visual impairments missed this question.

Exhibit 23: Rating of Airlines' Service

"Rate the overall service given by the agent at the airport"



Ease of Mobility through the Airport. All travellers were asked to rate the ease of mobility through the airport, including the ease of understanding the signage and other information systems. Three travellers, including two with physical and one with visual impairments, thought the ease of mobility was excellent. Three travellers with hearing impairments and one with visual impairments thought it was good; two travellers, including one physically-impaired and one learning-disabled, thought it was adequate, and two travellers with learning disabilities thought it was fair (Exhibit 24).

Exhibit 24: Rating of Airports' Facilities

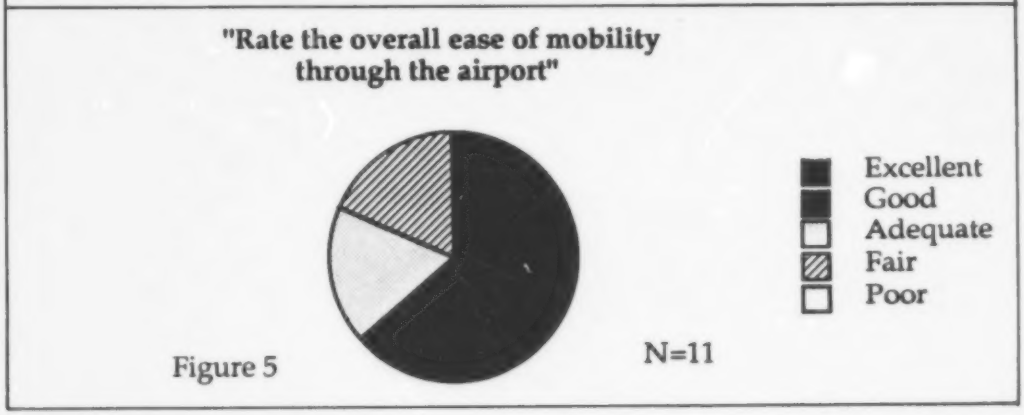
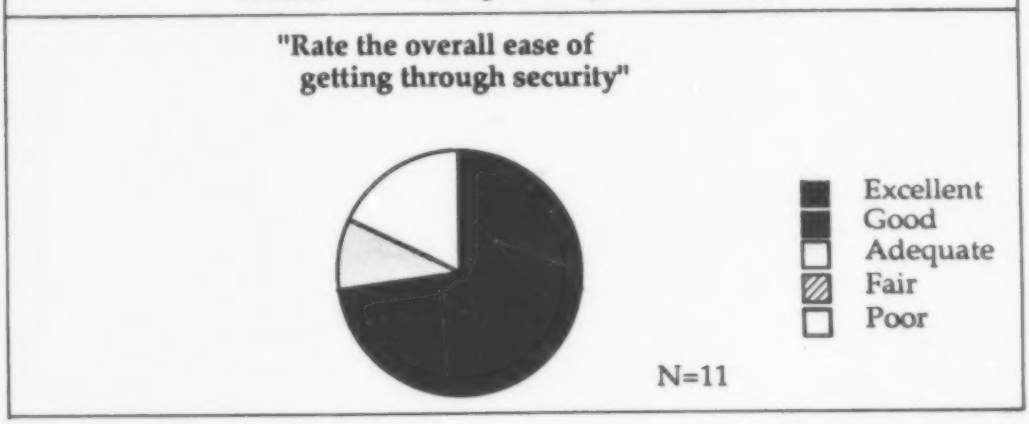


Figure 5

Ease of Getting through Security. All travellers were asked to rate the ease and comfort of going through security. Three participants, including one with hearing, one with physical and one with visual impairments felt the experience was excellent. Five travellers, including two hearing-impaired, one physically-impaired, one visually-impaired and one learning-disabled felt it was good. Two travellers with cognitive disabilities felt security was poor and one visually-impaired traveller felt it was adequate (Exhibit 25). One traveller with visual impairments did not participate.

Exhibit 25: Rating of Airports' Security



General Information Systems. The general information systems within the Vancouver Airport that were evaluated by visual inspection included: the flight arrival and departure information video terminals for both Air Canada and Canadian Airlines, airport information maps, emergency procedures and general signage within the terminal, and on-board safety cards. These systems were evaluated by seven of the twelve travellers including: two travellers with physical disabilities, two with hearing disabilities, and three travellers with learning disabilities. In general, the consensus of the

participants was that there is a need for improvement in several areas. A summary of the problems and some suggestions for improvements are contained in the following paragraphs.

Flight Arrival and Departure Video Terminals. Air Canada have recently implemented the use of multi-coloured monitors (red, white and blue) for arrival and departure information. A large part of the screen is taken up by an Air Canada logo. Late departures are highlighted by a red strip. The departure screens are located at the far end of the Air Canada check-in counters and are situated at eye level. The two screens indicating arrivals are located on the arrivals level of the airport.

Most of the travellers preferred the multi-coloured screen and felt that the white characters on a blue background created a good contrast. They felt, however, that the display characters were too close together and too small, degrading the legibility of the information. This was especially true for travellers in wheelchairs who could not get close enough to the screen to read it and who viewed it at a head-up angle. The learning disabled group felt that the time code should be written with a colon (12:30) rather than without (1230) to increase legibility and reduce confusion.

Travellers noticed that the second destination for a non-stop flight was often abbreviated to such an extent that, to some of the travellers, it was unintelligible. Other comments suggested that there was too much information on the screen and that the layout was poor. One traveller with learning disabilities recommended having alternating colours on each line to assist travellers who have difficulty reading condensed text.

Furthermore, none of the travellers understood the intention of the highlighted red strip (delayed flight indicator) superimposed on a flight number. They all indicated that a red-highlighted flight would be cause for concern and interpreted as a flight departing right away and that they would become very anxious if it was their flight. Interestingly, there was no legend to indicate whether the screen was indicating arrivals or departures. This could be very confusing to all infrequent travellers.

Canadian Airlines use monochrome (black and white) departure and arrival screens. There is a small logo on top of the screen to indicate that this is a Canadian Airlines display. Both departure and arrival screens are located in the same place. The screens are placed at eye level directly at the entrance to the terminal. Late departures are indicated by placing a small 'L' after the flight number.

Whereas most of the travellers felt that the screen logo for Air Canada was too big, they found the Canadian logo too small and difficult to find. Even though the Canadian videos are labeled departure or arrival screens, most travellers had difficulty locating them as they were small and obscure. Some travellers suggested that the arrival and departure screens should follow exactly the same format for ease of understanding.

Often, the abbreviations used to identify destinations were considered to be too short and therefore incomprehensible. Some travellers mentioned that the symbols were ambiguous and that in general there was not enough information about the flight on the screen. Another comment was that both the AM and PM signs as well as the 24-hour clock should be used as some people couldn't understand the 24-hour clock.

Travellers preferred the information layout on the Canadian versus the Air Canada screens although they felt that some colour on the Canadian ones would be beneficial. For both airlines, travellers experienced difficulties locating the screens within the terminal. The signage identifying the location of the screens should be improved. Another suggestion was that these screens shou!d also be auditorially accessible with an earphone, providing the same flight information as is provided over the phone.

Airport Information Map. The information map is located on both the arrivals and departures levels near the stairs. It is colour coded by function and each destination is numbered to correspond to a legend referenced alphabetically under function. Each floor is represented on a separate panel (see Exhibit 10 on page 36).

The learning-disabled group had difficulty in figuring out how to use the information map. In general, they found that the numbers on the map were confusing and current use of the colour coding did not help many of the travellers. They suggested that symbols be used instead of numbers and that the names, as well as the legend, should have the identical colour code. One subject was confused when the map said the barber shop was green and there was no actual green area in the airport.

Another complaint with the information map was that the top part of the map could not be seen from a seated position in a wheelchair. If the angle on the map could be increased and the numbers and lettering could be enlarged the information would probably be much more legible. Another suggestion was that the text on the map should be labeled as to the level the item of interest was located on to reduce searching time.

Subjects had difficulty obtaining the correct orientation. They suggested that the 'you are here' sign should be larger. Also, they said it would be useful to have an indication of which direction was north. One subject suggested that raised letters would be more effective as tactile information helps some learning-disabled to comprehend information more readily.

Emergency Procedures Signs. The emergency procedures signs have pictograms to identify appropriate procedures to follow in an emergency. Architectural drawings are used for wayfinding. The emergency procedure signs were poorly understood by most of the travellers. The sign was much too small and was not located in an accessible area. The map for evacuation procedures was not clear. The architectural drawing was very confusing and incomprehensible to all travellers questioned. The pictograms

for evacuation procedures were not easily understood. Most travellers agreed it would have been much more effective if photographs were used to describe the procedures rather than pictograms.

General Signage and Information Systems. The cognitively-disabled group had the most difficulty with signage. By accommodating their needs in terms of information comprehensibility, one would likely accommodate the vast majority of signage needs for the lay traveller. Overall the learning disabled group found that the signs at the airport were not clear. One of the travellers with cognitive disabilities pointed out that "*... the biggest signs in the airport are for advertising rather than for direction*".

They also found that changing or moving signs were the most difficult to understand. Signs that are in two languages are also very confusing. It would be better to make two separate signs or at least to have some form of separation between the notices (i.e. a heavy line). Signs to the gates are also confusing: does the direction the airplane points indicate the way or do the arrows indicate the correct route? One subject suggested that all signs should be in pictograms rather than in words, as long as the pictograms are meaningful. Another subject suggested that an airport with lots of windows aids direction finding by giving external visual clues. One subject said that she would find it much easier to find her direction in the airport if the airport itself were colour-coded somehow.

On-Board Safety Cards. There has been a lot of concern about the optimal design of passenger safety cards for the able-bodied as well as the disabled. Purswell et al (1987) found that travellers cannot recall more than 4 or 5 items of information from safety cards. This result was echoed by a U.S. National Transportation Board investigation (26) which found that "passengers don't pay attention to safety cards but have a much better retention rate when they watch attendants". Krysor & Schmidt (33) asked 25 able-bodied subjects to rank 33 passenger safety cards for perceived effectiveness. These cards were categorized for their content and placed into one of five categories by the investigators depending on the amount of words, pictures and pictograms they contained. They found that the most preferred cards were the larger ones with less words and which integrated words with pictures. The researchers also looked at retention of information on the cards and found that there was a very low retention rate for all of the cards. They suggested that the pictogram format which integrated words was the most effective safety card.

Safety cards have been criticized for: the meaningfulness of signal words, the reading comprehension level and the meaningfulness of a symbol for a culturally diverse travelling population (Purswell et al 1987). Mallette (1988) emphasizes the need to develop safety cards taking into account the characteristics of the subject group, the prevailing circumstances and the environment in which they will be read. This is particularly important for the large percentage of travellers who are disabled and for whom the special emergency procedures information is not presented adequately.

Railway Information Systems

Travellers with hearing and cognitive disabilities had little experience travelling by train. Participants with visual disabilities had the most experience and those with physical disabilities intermediary. Reasons stated for not using the rail system more often included time constraints, inconvenience, and cost (once the price for berth and meals were added to the travel cost). The situation is different in the Corridor where travel time is shorter (note that the majority of passengers are in the Corridor).

Rail Travel Arrangements. Most rail travellers call the railway information number directly rather than going through a travel agent. Generally, callers enquire about travel options, make a decision, and then make a reservation. One focus group participant mentioned that after making a reservation, the train was cancelled and no one had notified him.

Since it was established in the cognitively-disabled focus group sessions that these travellers did not experience difficulties making travel arrangements, they did not participate in this part of the study. The travel arrangements for one traveller from each of the three (visual, hearing and physical) disability groups were assessed. In making the ticket reservations, 78 percent of the questions asked were initiated by the traveller and 22 percent were initiated by the ticket agent.

For the group with visual disabilities, 67 percent of the questions were initiated by the traveller and 33 percent by the agent. Those questions asked by the agent were whether or not the traveller needed: meet and assist in Vancouver, help with baggage in Prince Rupert, and a reduced fare for a companion. Eighty-three percent of the questions initiated by the traveller were answered immediately by the agent. In one case, the answer was delayed; the question was if braille cards were available. The reservation took 15.02 minutes and there were two interruptions.

When a traveller with physical disabilities made the simulated rail enquiries, 77 percent of the questions were initiated by the traveller and 23 percent by the agent. Those questions asked by the agent were if the traveller had: a medical certificate to prove that an attendant was needed, if meal service would be at the seat, and if the traveller could arrive early at the station to take advantage of the pre-boarding service. All of the questions initiated by the traveller were answered immediately. The reservation took 14.30 minutes and there was only one interruption.

For the hearing-impaired rail travel simulation, 83 percent of the questions were initiated by the traveller and 11 percent by the agent. The question asked by the agent was whether or not the traveller was aware of the pre-boarding service if it was requested. Seventy percent of the questions initiated by the traveller were answered immediately by the agent. In 25 percent of the questions, the answers concerning availability of TDD terminals and whether or not the staff knew sign language were delayed.

Of the questions initiated by the traveller, 86 percent were answered immediately and 14 percent of the answers were delayed. None of the questions were answered in an uncertain manner nor were they changed further along in the conversation. The mean time to make a reservation was 18 minutes and 07 seconds (sd 2:03). The traveller was put on hold approximately 1.3 times per conversation. A TDD was not used.

One traveller with hearing disabilities thought the service given by the agents was excellent. The travellers with physical and visual disabilities thought the service was good. The traveller with hearing disabilities thought the overall knowledge of the agent for travelling with his disability was excellent, the physically-disabled passenger thought it was good, while the visually-impaired traveller thought it was adequate.

Checking-In at the Terminal. A number of travellers experienced service inconsistencies when checking in at the station. A focus group participant travelling with a guide dog was incorrectly told that an attendant could not travel on the same ticket. He stated: *"It must be understood by the rail attendants that a guide dog cannot identify exits or other location points."* Normally, persons with visual or hearing impairments can travel with a harnessed guide-dog and an escort free-of-charge. On occasion, assistance was said to be available but, upon arrival, was not.

Travellers with hearing disabilities expressed similar concerns as those expressed about airport terminals, and that is not being able to hear PA announcements. However, in the Vancouver station, there is only a static information display and not even a small video screen which could be updated to display the current status of any train delays.

On-Board the Train. Once again inconsistencies in service were expressed. Some travellers with visual impairments stated that conductor assistance to the dining room was available while others said they got no help at all. Concern was also expressed about the lack of opportunities for relieving guide dogs during a long train trip.

Some travellers felt that the rail system tried to shift the responsibility of assistance onto the traveller with disabilities by offering two-for-one tickets. This was viewed *"... in a sense as discriminatory because it means that you cannot travel alone should you wish to do so and that's a concern, or I shouldn't say cannot, but it just makes it so difficult that you don't really feel comfortable."*

Travellers with hearing impairments pointed out that the information announcements and services for the deaf are lacking, stating that you *"can't hear meal calls, stops or anything."* The hearing-disabled group suggested modifying a rail car with video screens that would display station stops and other announcements for travellers with hearing impairments.

Terminal Information Systems. Most of the focus group participants with experience in rail travel had no criticisms in terms of the train stations except for the lack of visual displays so that travellers with hearing impairments can obtain information that is provided over the public address system. When attempting to undertake the rail travel simulations, the researchers were informed that, during the summer months, it was not possible for travellers to book their seats in advance without purchasing a ticket. Since it was not possible to simulate the day of departure scenario it was agreed that rail simulations would be replaced with an ergonomic assessment of the travel information systems completed by an ergonomist.

Departures and arrivals screens at the train station consist of a static display with white letters on a black board. The board is located at a height of 2.5 meters and is visually unobstructed from the entrance. Despite the good visibility and contrast of the display, the letters are small (only about 2.5 cm high), making it difficult to read and posing a problem not only for travellers with visual disabilities but also for passengers with physical disabilities who are viewing the screen from a seated position. The display boards are also fairly small, approximately 0.5m by 0.5m. The destination/time information is very cramped, making it very difficult to differentiate between the items. Travellers with learning disabilities would be prone to confuse the information displayed.

The only clock in the station is labeled with large roman numeral on the outside circle and small arabic numerals along an inside circle. Most probably, this type of clock face would be incomprehensible to a traveller who had a learning disability (large arabic numerals would be better).

Generally, the other signage in the terminal, such as washroom location and baggage pick-up, are very clear. The check-in counter is easily identifiable and the building provides good wayfinding cues for the sighted traveller. Most of the signs are located at the same level around the periphery of the station. This consistency in location cues the traveller as to where to look for direction information (Boersma 1984). For the visually disabled, it is suggested that floor texturing be used to indicate information areas and check-in areas (CNIB 1987). Glare degrades th visibility of some signs. The signs should have a matt finish and in some situations it may be appropriate to redirect the light source.

A TDD is available at the station for persons with hearing impairments. At present, however, there is no signage to indicate where it is located. It is recommended that the position of the TDD be clearly marked to reduce confusion for the hearing-impaired.

It is important to review the comments in this section as they relate to the Vancouver train station. Similar or other problems may exist at the other train stations. Depending on the future of the Canadian railway system and its business intentions, it may be useful to do a more in-depth assessment of the travel information systems at different train stations.

DISCUSSION OF EXPERIENCES

When planning a trip, moving through the terminal and being on-board, there are numerous occasions when a traveller interacts with different travel information systems. In this section, the information system experiences of the focus group participants are presented for each group. To make the discussion more manageable, the travel experiences for the airlines are subdivided into: making flight arrangements, checking in at the terminal, from check-in to the gate, on-board the aircraft, upon arrival at destination, and moving about the terminal. Within the context of these sub-divisions, the results from the travel simulations will also be discussed.

Travellers with Physical Disabilities

Travellers with a wide range of physical disabilities attended the focus group session. Some participants used respirators and electric wheelchairs, others used manual wheelchairs, while others used a scooter. Participants had experience travelling with and without companions. Being accompanied by a companion frequently was a function of the severity of the disability. Most travellers had flown in the past months for business reasons.

Making Travel Arrangements. Travellers with physical disabilities generally have a preference for booking their travel arrangements through a travel agent rather than the airlines; finding it less of a 'hassle' to deal with someone who is familiar with their disability. Unless an agent is familiar with the traveller's needs, doubt may be expressed about the information provided by the traveller such as the type of battery in an electric chair, the seat selection (bulkhead seat and close to the washrooms), the time needed between connecting flights. Travellers believe they know as much (if not more) as carrier personnel about their chair in terms of battery type (acid, dry or gel cell) and folding and storage needs, suggesting that airline agents should be more accepting of the information received.

Participants expressed a desire to sit near the entrance, proposing that it is beneficial to both the traveller and the airlines. When making reservations, confusion frequently results as to whether or not the traveller can walk down the aisle. Focus group participants stated that they could hoist themselves into a seat if seated at the entrance. Sitting at or near the entrance also reduces the need to transfer onto the uncomfortable airline wheelchairs. Sitting in an aisle seat was not viewed as a sufficient compromise since aisles are so narrow. It was suggested that a number of bulkhead seats for travellers with physical disabilities be reserved up to 24 hours flight departures (or until the flight is fully booked). A number of travellers expressed a preference for sitting close to the washrooms, especially on long flights. These passengers are frequently pre-boarded and taken off last, adding an additional 30-60 minutes to the flying time.

The recent modification of flexible armrests to some aircraft should make seat accessibility easier. Some travellers have asked whether this feature was available on the selected flight and often the reservation agent did not know. Some travellers consulted the Air Canada flight schedule booklet for seating arrangements (bulkhead seats and proximity to the washrooms) before calling the agents; however, most travellers were not aware that this information was available (it isn't in the Canadian Airlines schedule).

Most travellers noted that attendants could travel for a reduced fare. Not all travellers were aware, however, that a medical certificate was needed to verify the need for an attendant. Air Canada keeps a medical database with doctors certificates for one year. The comment by one of the participants in a wheelchair was *"Why is it only good for one year? Do they think I am going to get better or what?"* With Canadian Airlines it is necessary to obtain a doctor's certificate for each flight that an attendant is required. As a service to frequent travellers and to reduce the reservation times, it may be an idea for the airlines to create a database on passenger preferences and needs. Such databases have been created by some hotels for frequent customers and were suggested by Roberts and Wong (31) in the form of 'smart' cards. Passenger preferences and needs could also be stored in an expanded 'frequent flyer' database in the computer reservation system. Since it would take some time to implement either recommendation in one form or another, reservation agents in the meantime should be well-versed on the questions used during the simulated reservation phase (and outlined in Appendix D).

The results from the simulated travel reservations were rather encouraging. Seventy-five percent (75%) of the reservation questions were initiated by the traveller. Eighty-seven percent (87%) of these questions were answered immediately by the agent. An answer was delayed in seven percent of cases; these included questions about the type of aircraft and about the proper battery packaging. Only in one instance was the agent uncertain about an answer; the question related to whether or not the armrests could be swung away in the aircraft. Of all the questions initiated by the travellers, 45 were answered correctly and three were answered incorrectly.

Twenty-five percent (25%) of all the questions were initiated by the agent. Two of the three agents initiated the questions of 'meet and assist', of when the traveller would be leaving their chair at the airport and if the chair would be waiting when the traveller deplaned. Other questions which were initiated by various agents were: if the flight was a non-stop flight, the type of aircraft on the flight, if the traveller had to change terminals, the check-in time, and if a certificate was required by the traveller.

One physically-disabled traveller thought the service they were given by the agent was excellent and two thought it was good. One traveller thought the knowledge of the agent was good and two thought it was adequate. The mean time to make a reservation was 16.06 minutes and there were 0.7 interruptions on average.

Checking In at the Terminal. Most of the problems for a traveller with physical disabilities seem to happen during check-in. First, there is always a lot of discussion about transferring to an airline wheelchair. It must be understood that the wheelchair, to a physically-disabled individual, *"is like a person's legs"*. Using a different wheelchair is not a happy experience. Furthermore, if the traveller gets transferred into a straight-back, narrow chair with small wheels, they feel very insecure and are generally confined to the area where the wheelchair has been left.

Most travellers were not aware that if they arrived well ahead of flight departure (one hour), the airline policy allows them to wheel up to the gate in their own wheelchair. It has happened on occasions, however, where a traveller in a wheelchair arrived early and the check-in agent told them to come back 30 minutes before flight departure (another example of the traveller's knowledge being discounted by the agent).

During the simulations, travellers had no trouble approaching the different airline ticket agents. Most of the travellers felt that the newly-designed Air Canada counters accommodated their needs very well by having an extra shelf for writing on and by placing them closer to the agent's eye level. However, as discovered in the focus group sessions, most of the inconsistencies and complications occurred over the procedures for handling the various wheelchairs. One traveller on one airline was designated as travelling with his own chair. The agent offered to have the chair brought to the ramp in Toronto, but were not going to allow his chair to the gate even though he had checked in before one hour to departure.

Another source of concern for the traveller with physical disabilities is the number of pieces counted as hand luggage. In certain cases where a traveller needs a respirator, they also need a back-up system should the respirator fail in-flight. Presently, the airline policy, or the traveller experience has been, that the second back-up respirator is put into the cargo hold. Some travellers feel that two back-up systems are necessary.

Additional frustration has been expressed by the travellers travelling with a wheelchair or scooter in terms of packaging at check-in. Frequently, they are put into boxes without labels or sufficient padding. As a result, parts have been lost and wheelchairs have arrived damaged.

One airline once used the word "Invalid" on passenger boarding cards. Persons with physical disabilities were offended by this word and, in turn, boycotted the airline. Care should be taken to avoid using this term.

Most of the answers given to the travellers, during the simulations, about their flight by the airline agents were in agreement with their experiences at the airport. For two of the three travellers, the seat selections given over the phone were not the same as they received at the airport. In one case, the traveller was relocated to the end of the aircraft, making it unnecessarily difficult to plane and deplane.

In one simulation, a traveller was told over the phone that they would not be able to have their chair brought out of the hold during a stopover, but when they arrived at the airport, the agent said it would not be a problem -- the traveller was satisfied but not instilled with confidence.

One traveller with a battery-operated respirator got the impression that the staff were so unconcerned about his needs that he felt somewhat uncomfortable. He felt that he should have been advised to proceed to the gate immediately since he knew the security check was slow and the gate was at the far end of the terminal. The same traveller also felt, despite airline agent assurances, that the time between two connecting flights (approximately 45 minutes) was not sufficient and that he would have probably missed the connecting flight.

In two out of three travel simulations, agents told travellers on the phone that they would not have to pack their batteries in any special way. But when they arrived at the airport, they were told that the batteries did in fact need special packing. The information was true for one of the batteries because it was a wet cell but not for the other which was a 'gel cell' battery; however, the agent would not listen to the traveller.

Even though simulation participants rated the service given by the agents as good, it is critical that reservation information and special requests are not lost when there are aircraft changes and that the handling policies of wheelchairs are consistent. For this group, both travellers who asked for a written itinerary over the phone did not receive one at the airport.

From Check-In to the Gate. During the simulations, travellers experienced little problem navigating the airport and accessing different services. Two travellers rated ease of mobility through the airport as excellent. One rated it adequate.

In general, the travellers didn't experience any problems going through security. Wheelchair users are generally searched with a wand. None were sure, however, where they should wait after they were told they would not be going through the security gate. Signage doesn't indicate the procedure or waiting area. These observations were confirmed during the simulations. Some travellers also felt that they were not properly checked by the security guards. In one instance, a quizzical expression was evident on the security guard's face. It is essential that security personnel are better trained in searching wheelchairs. One traveller rated ease of getting through security as excellent; two rated it as good.

If a person in a wheelchair does wheel up in their own chair to the boarding gate, there generally is a lot of disagreement between ground crews in terms of how the battery and the wheelchair should be packaged. Often ground crew members have difficulty identifying the difference between an acid and a gel cell battery. Furthermore, they may not be

familiar with how to collapse a wheelchair model. Instead of listening to the traveller or asking the traveller how it should be done, they may apply force and dismember parts of the wheelchair which are unnecessary. These focus group observations were once again confirmed during the simulations.

All of the passengers with physical disabilities were offered pre-boarding. In general, gate agents were ready for the traveller but the handling of the wheelchair or scooter became an issue. In one case, they were not sure how to pack the scooter at the gate. They felt that it should not have been allowed to the gate in the first place. In another case, the gate agent didn't notice until the traveller was being transferred that he was in a powered chair and that there wasn't sufficient time to collapse and package the wheelchair. Often, gate agents would wait until the last minute before transferring the travellers to the airline chair.

The aforementioned problems are often magnified when the wheelchair traveller takes a flight on a small aircraft which loads the passengers from the tarmac. At the present time, there is no satisfactory means for getting a traveller with physical disabilities on board. The Transportation Development Centre is presently sponsoring a project examining the feasibility of developing a pallet boarding device to be used for boarding travellers in wheelchairs onto small aircraft (TDC Project Directory, 1988).

On-Board the Aircraft. The most common discrepancies between what a traveller with a wheelchair requested and what was encountered on-board relates to seat assignment. *"Airline agents don't always understand why it is important for a wheelchair person to be close to a washroom."* *"It seems to me it would make the most sense in the world if the first available seat to the doors which are accessible from our own chairs be made available to people in wheelchairs"*. The reservation agents should listen to the passenger, explain the options available and allow the passenger to make the choice. On a long flight, it may be important to be near the washrooms; on a short flight, a bulkhead seat may be desired.

Another reason why travellers with physical disabilities would like to rely less on ground crew assistance is because there appears to be an information gap: *"most crew members do not know how to lift a person on board and often do not listen to the wheelchair person especially if they have a soft voice"* (or one weakened by illness such as multiple sclerosis).

To decrease wheelchair damage and to have the wheelchair available for disembarking, the focus group participants felt strongly that the wheelchair should be stored in the cabin. Some participants mused over the fact that space has been provided for travellers with collapsible garment bags but not for the *"legs"* of a traveller with physical disabilities. In spite of the efforts of some of Canada's airlines, on-board wheelchair storage in the garment area was vetoed unanimously by the airline industry because of the problems of storing such a rigid object.

In terms of observing emergency procedures, wheelchair travellers often say to themselves at the end of the demonstration *"we know where the doors are, but nobody ever tells me how I am going to get to the door in case of an emergency"*. To improve the effectiveness of the on-board safety demonstration, it should address the special needs of the traveller with physical disabilities, perhaps through a special brochure or personal explanation (although persons with physical disabilities generally do not wish to have special attention drawn to them).

Upon Arrival at Destination. There have been occasions during long stopovers where a wheelchair passenger will request the use of their own chair. In a couple of these instances, the traveller was offered a manual airline/airport wheelchair instead of their own. It is difficult to decide whether this mis-communication was a result of a travel information problem, i.e. the gate agent at the destination was only notified that a wheelchair would be needed and not that the passenger had requested their own electric chair since they cannot operate a manual airport wheelchair.

Focus group participants also reported inconsistencies in terms of being met by ground personnel upon arrival: *"Sometimes ground crew are waiting on the bridge ... at other times a person has to wait and wait ... it's pretty hit and miss kind of process"*. Once again, it is difficult to identify the reason for these inconsistencies. Nevertheless, it should be a target for improvement for the airlines.

On numerous occasions, wheelchairs have arrived damaged, bent, with parts missing, or with blown tires. Baggage handlers should perhaps be better trained in handling wheelchairs. Problems also occur in non-containerized aircraft with load shifting in flight. Airlines tend to realize how much travellers with physical disabilities rely on their wheelchair. Generally, wheelchair users are immobile when their chairs are out of service. Hence provisions are usually made at each airport to identify a company that can service damaged wheelchairs within 24 hours and a substitute chair can be provided. Although the system is in place to repair wheelchairs, it may not always function properly and problems do occur.

Moving about the Terminal. The problems of negotiating airport terminals upon arrival vary. In Vancouver, some travellers have experienced difficulties in getting downstairs, either to customs or the baggage arrival area, since they felt it was necessary to find a person with a key to use the elevator. In Toronto, ground crew usually do not bring the travellers wheelchair to the gate because of the vast distances. Smaller airports usually lack experience in how to assist travellers with physical disabilities and in Ottawa the signage during the renovations was difficult to follow. In general, however, airports are designed to be fully accessible and design standards have been developed and applied to ensure accessibility (see "Barrier-Free Design Standards for Airport Buildings", September 1986).

Travellers with Visual Disabilities

The participants of the visually-disabled focus group included persons with guide dogs, white cane users and partially-sighted individuals. The focus group participants had experience travelling both on their own and with a companion. Some participants flew more frequently for business reasons while other participants travelled solely for holiday reasons. The focus group participants felt that they were somewhat exceptional in terms of the blind community because all of those who attended were considered to be very mobile compared to the norm for blind persons.

Making Travel Arrangements: Often travellers with visual impairments will call the airlines directly because they feel, especially if they are travelling with a guide dog, that a travel agent might not be able to answer all their questions. In addition, it gives them an added sense of security that their 'meet and assist' needs have been noted.

Compared to the other disability groups, blind travellers were the most willing group to identify their disability to the airline agent. Experienced travellers with guide dogs, however, have learned not to inform the agent about the guide dog until after they have booked the ticket for the following reasons: *"... if I tell them that I have a guide dog they seem to panic. I immediately get put on hold and then they come back and say things like, um, the dog has to go under the seat ..."*

In terms of seating preferences, most airlines assume that travellers with visual disabilities prefer the aisle seat. This is not always the case. It would be better if the agent asked the traveller about their seat preferences than to assume them. Another assumption of the airlines is that passengers with guide dogs are most comfortable in bulkhead seats. Some travellers with guide dogs felt these seats were extremely uncomfortable. There is no place for the dog to curl up or for the passenger to stretch their legs. As one participant said: *"it's imperative that this information gets into the report so that it reaches those who will be reading this information to make the policy more flexible"*.

All participants noted that the airlines offered 50% reductions on fares for attendants. This raised some concern amongst the participants. They felt that maybe airlines would insist on attendants for travellers with visual disabilities as the airlines endure staff shortages and increasing traffic. Some participants thought that such a policy would severely curtail their independence and also reduce the frequency with which they travel.

In general, the participants felt fairly comfortable dealing with the reservation agents. In a number of instances, participants recalled airlines calling the traveller after they had made the reservation to enquire whether or not they had experience travelling with a guide dog, *"in other words, it was a concern on my behalf as a passenger"*. In another

situation, a traveller's flight was delayed by 3-4 hours so they advised him not to come to the airport till then and enquired whether or not they should notify any persons at the arrival destination.

During the simulated flight reservations, 77 percent of the questions posed by travellers were answered immediately by the agent and only one of the answers was delayed; the agent was not sure if a medical certificate was required to prove that the traveller needed assistance. Four questions were answered with an uncertain response, including: if a rigid cane carried by the traveller could be kept at the traveller's seat, if there was an extra cost for a guide dog, if arrangements could be made to relieve the dog during a connecting flight, and if a vet certificate was needed for the dog when travelling to the United States.

Of all the 24 questions initiated by the travellers, 19 of the responses by the agents were correct and were experienced as expected at the airport. Six were answered incorrectly. While making the reservation, one traveller was incorrectly given an exit seat. Another was told she could keep her cane at her seat although this was not allowed upon arrival at the gate. And one traveller with a guide dog was told that he would not need a vet certificate, but when he arrived at the airport was told it was required. In all three cases, travellers were not given written flight information, although they had asked for it during their reservation call.

Two out of the three participants felt that the service provided was excellent and one person felt it was adequate. One person felt that the agents knowledge of a visually-impaired persons concerns when travelling was excellent and two thought it was good. The mean time to make a reservation was 15 minutes 23 seconds (with a standard deviation of 3:16). There were 1.3 interruptions on average.

Checking In at the Terminal. Upon checking in, problems of travellers with visual disabilities relate mainly to seat changes. In some instances, the seat assigned over the phone was changed to a bulkhead seat; at other times, seat preferences were not even noted. The later situation happens when a scheduled aircraft has been replaced resulting in a loss of parts of the passenger manifest. Improvements in the available information system should eliminate these problems.

Generally, travellers with visual disabilities are assisted to the gate by an airline representative. Some travellers are slightly taken aback when their boarding pass and ticket are not handed back but rather are given to the attendant. In these situations, travellers feel that they are not being treated as responsible adults. Visually-impaired travellers find it slightly amusing when they are offered a wheelchair by the airline representative; they have learned to trust their footing even if they can not see where they are going. It becomes evident from these situations that knowledge of assisting travellers with disabilities needs to be broadened.

In general, during the simulations, travellers experienced few problems getting their tickets and confirming their flight information. One traveller found *"The ticket agent was great. I was told there was no problem with my seat selection and that they had the 'meet and assist' message in the computer"*. Another travelling to Grande Prairie said *"... I got help from the airline agent to get to the right ticket counter ... they were all very helpful ... they called for an assistant on the pager for me"*. One traveller with a guide dog did experience some difficulties; his comments were: *"Two agents ended up working on my file. At times they spoke to each other without consulting me as to what I wanted. They didn't know the regulations about a vet certificate when flying to the United States and it took them a long time to find out. The agent tried to change the seat I wanted to a bulkhead one because of the dog even though I told her it was better for my dog without a bulkhead seat. I suggest that agents insure passenger seating preference and don't just assume they know what is correct ... each need is different ... listening to the traveller should be part of the service"*. This final comment summarizes the general feeling of the participants that there should be some knowledge on the part of the agents but they should also be open to suggestions from the traveller.

From Check-In to the Gate. Going from the process of checking-in to the gate, there are three situations which are disconcerting to travellers with visual disabilities. The first situation occurs when the passenger is asked to wait in a waiting area until someone returns to assist them to their flight. Often the traveller with visual disabilities is wondering *"when will you come back for me"* and after awhile starts feeling anxious and perhaps even forgotten. On a number of occasions, this has actually happened. These travellers, therefore, listen very carefully to public address (PA) announcements concerning their flight, especially if they haven't been assisted yet. As a few participants commented: *"I depend on the PA announcements. I certainly listen for them and I listen for my flight. They are invaluable"*. Problems still occur, however, *"I find the acoustics poor. They are generally hard to hear and Vancouver is really bad"*. In fact, *"... the only place you can hear them clearly is in the washroom. Everywhere else they reverberate."* Airline personnel should inform the traveller when they will be back (most travellers wear watches without faceplates).

The second situation where visually-impaired travellers experience problems is the way airline agents interact with them. Often travellers are not given boarding passes and flight tickets until they reach the gate. If they do hold onto their boarding pass and it happens to be sticking out from the pocket, agents have been known to insensitively retrieve the ticket without asking the traveller. On occasions, travellers have, very inappropriately, been pulled along by their white cane. Adult visually-impaired travellers are generally quite capable of taking care of themselves and should be treated as responsible adults.

The third situation which creates anxiety for visually-impaired travellers is going through security. The following focus group excerpts explain the situation best: *"I have problems with security all the time, with being separated from my bags. They put them on a conveyor ... and they do not re-acquaint me with them ... and they have a lot of problems dealing with my dog. I walked through security the other day and as I walked forward some hand reached out and grabbed my dog's harness handle ... Picking up the handle gives the dog the cue to start walking and now he thinks he's in a work mode or is being distracted from what his attention should be to me. Security people really need a lot of training". "I've had the same thing happen to me and my dog and it's awful. I had to take the wand and stick it in his ears ... it really upsets the dog especially when the wand comes near the harness or the collar and this thing starts to squeal". "One time I was supposed to find my white cane for myself ... I was standing there in the middle of the security area being wanded when they moved onto another passenger ... my cane and packsack were somewhere over there and now I'm being bumped by other passengers who don't know I'm blind because I don't have my cane".* These comments by the focus group participants illustrate many of the problems encountered by persons with visual disabilities when going through security at the airport.

During the simulations, on the other hand, proceeding through security went quite well for all of the travellers with visual impairments. One person complained that the attendant did not re-acquaint her with her baggage after going through security and had to be reminded. Another mentioned that the agent reached for his boarding pass out of his breast pocket without being asked which violated his independence. Other than these concerns there were no complaints about the security process.

The travellers participating in the simulations generally felt that the assistance given by the airlines in moving around the airport was good. *"... the agents took me to the gate with lots of time in advance and she did know the proper way to lead me". "The agent was helpful and willing to help me to relieve the dog".* In one case, however, a traveller was left directly in front of the entrance doors blocking incoming passengers while the agent went to check on something. All of the participants mentioned that alternative methods of communication at the airport would increase their independence and mobility. One mentioned texturing the floor surface from the main doors to the ticket counters or special needs booth. These would aid the traveller in getting to the correct area in the terminal, particularly for those travellers with partial blindness. It would appear, however, that those with total blindness will always need some degree of assistance. Another reiterated that the auditory announcements are incomprehensible.

In all cases, the procedure at the gate went very well. All of the travellers were allowed to pre-board and were well informed of the boarding procedures by the gate attendants.

On-Board the Aircraft. The visually-impaired focus group pointed out many problems with the on-board travel information systems ranging from flight attendants' assistance to auditory communications.

Trying to be polite, flight attendants on small aircraft may let the visually-impaired traveller proceed ahead of them. But because these travellers are not familiar with the layout, this action is inappropriate. Convention for guiding a blind person is for the sighted individual to lead.

Travellers with visual impairments frequently make a point of introducing themselves in order that they may be addressed by name by the flight attendant. This way the traveller knows they, and not the person beside them, are being addressed. It is strongly recommended that flight attendants familiarize the visually-impaired traveller with the aircraft. It is important to identify the safety features, the various push buttons located on the armrest and above the seat, the location of the washroom and the washroom interior. In the words of one participant, "*... the main problem is not getting to the washroom, but once you are in those minute washrooms there are gadgets galore and you end up pulling this and pushing that and things go pop, pop, pop. I get thoroughly mystified as to what's going on. Often, I don't find what I am looking for*". Some flight attendants, however, provide too much assistance such as fastening the seat belt for the passenger, or waiting outside the washroom for the passenger to reappear. One of the main travel information systems that needs to be improved is the knowledge of airline personnel in the handling of travellers with disabilities.

It has been suggested that it may be useful to have on-board emergency flight procedures on tape for visually-impaired and other travellers. Another suggestion was to provide one or two safety cards in large print or braille on each flight. A visual demonstration of how to put on the life jacket and inflate the vest means very little to the visually-impaired traveller; or, for instance, "*... like you know they tell you to keep on your seat belt until the sign goes off, eh, but they never tell you when the sign goes off*". The idea of braille safety cards, however, has not been accepted by the airlines due to the cost and the small numbers of individuals who can read braille. The airlines believe that it is better during the pre-boarding process to provide individual safety information.

Another suggestion that was made by the focus group participants is that the airport management and airlines should periodically organize airplane and emergency familiarization tours for travellers with visual impairments. In all likelihood, even non-travellers with disabilities would welcome the opportunity to improve the preparedness in case of a real emergency.

Some travellers report losing control of their personnel possessions if they do not put them away themselves and other travellers felt that airlines should subscribe to braille magazines such as MacLeans or Readers Digest or have magazines available on tape and or one of the airplane channels.

Upon Arrival at Destination. Generally, few problems were identified upon arrival. Usually airline agents were standing by as the passengers were deplaning. However, sometimes they can be too helpful in wanting to assist with the guide dog and personal luggage. It is always important to first ask the traveller with visual impairments what assistance is required.

Travellers did observe that sometimes they have trouble identifying their luggage to the airline assistant. Experienced travellers attach a colourful tag or bow to their cargo and hand luggage. Having such tags available upon check-in may be useful for the non-experienced traveller.

Some travellers felt abandoned when the airline assist agent did not to see to it that the traveller had actually found some form of public transportation immediately. Travellers with visual disabilities would greatly appreciate the agents taking those few extra minutes to assist them.

Contrary to the desires of wheelchair travellers, blind travellers will attempt to reduce the time they have between flights as much as possible since they find it rather boring to sit around an airport.

Moving About the Terminal. Most travellers felt that airport signage and traveller orientation could be improved. Signs and screens should be in larger print for travellers with poor vision. In most instances, it would also facilitate the comprehensibility of a display for all travellers. Suggestions were also made that certain information displays should be audio accessible. A similar recommendation was made by the travellers with cognitive disabilities. Augmentative, or duplicative, information systems seem to be a requirement for many travellers.

Implementing the recommendations made in a recent study, entitled "Access Needs of Blind and Viaullay Impaired Travellers in Transportation Terminals: A Study and Design Guidelines", by the Canadian National Institute for the Blind (December 1987) would also greatly facilitate the access needs of visually-impaired travellers in transportation terminals. The recommendations deal specifically with visual impairments and access issues and are intended to be applied in conjunction with the broader existing standards that have been developed for all persons with disabilities.

Some of the recommendations of the CNIB report having a direct bearing on traveller information systems include: consistently-placed and readily-locatable information desks, high colour/brightness contrast signage (light characters on dark backgrounds), sans serif large character signage, specific tactile signage at doors and openings from public areas, information telephone placed near the entrance, copies available of tactile/large print or audio casette orientation maps, special flight departure monitors placed at eye level for the visually-impaired, and the presence of trained, knowledgeable and caring service personnel available to offer reasonable assistance upon request.

Travellers with Hearing Disabilities

It was more common for the hearing-disabled focus group participants to have travelled by air than by rail during the past 18 months. Participants had travelled for business, family and leisure reasons, within the province, across Canada and to the United States. Participants flew by themselves, and some travelled with companions.

Making Travel Arrangements. Travellers with hearing disabilities seem to prefer arranging their flights in person with a travel agent to avoid misunderstandings. Many of the misunderstandings related to: the cost of a ticket, preferable departure times, whether or not a flight was direct, and seat preferences. Problems were fewer if the airline's TDD number was used rather than the Message Relay Centre. Making arrangements with a travel agent was preferred because travellers could write back and forth to the agent and see if the travel agent was confused about anything that was written. Once a hearing-impaired traveller has initiated their trip, they very rarely change their return ticket because of the limitations in accessing the information systems. If they have to make changes to their travel plans, they will either go to the airline office or the airport.

During the flight reservation simulations, travellers with hearing disabilities initiated most of the questions. Reservation agents answered 55 percent of the questions immediately and 30 percent of the answers were delayed. Agents had difficulty answering the following questions: whether there was a TDD in the airport, whether staff knew sign language, whether the traveller was allowed to sit near an exit seat, and the type of plane on the flight. In 11 percent of the questions asked, agents were uncertain as to the correct response; such as, if there were TDD's available and if there was a reduced fare for an attendant.

Nineteen (19) percent of the questions were initiated by the agent. Two of the three agents asked whether 'meet and assist' would be required. One mentioned that all the flights were non-stop and that there would be enough time between flights for connections. Another agent mentioned the check-in time without being prompted.

Travellers rated the service given by the reservation agents from excellent to poor. Comments were rated poor if the response was hesitant. The mean time to make a reservation was 24 minutes and 8 seconds (sd 6:25). There were 1.7 interruptions on average. Communicating with a TDD took approximately 30 percent more time than verbal communications.

Checking In at the Terminal. Participants reported that, on a number of occasions, they had attempted to reserve seats close together for a team so that they could communicate with one another, only to discover upon check-in that the airlines had made no attempt to seat them together.

It has happened on occasion that, when travellers with hearing impairments checked in for connecting flights, they were put on stand-by. This was very disconcerting to the traveller because of the difficulties in communicating and understanding the circumstances. In some instances, travellers felt quite panicky.

During the simulation check-in procedures, the hearing-impaired group had mixed experiences while picking up their tickets. One traveller had a very negative experience. *"The ticket agent was rude and unsympathetic ... she was trying to speak to me ... it was an effort to get her to write. She did not make an effort to find someone who knew how to speak sign language, and also didn't know anything about the TDD's at the airport"*. It became evident during the discussions that there was no note on the traveller's file to indicate that they were deaf. The two other travellers with hearing impairments were pleased with the service: *"The agent related very well to me with writing and gesticulation ... I was given a printout of what was written on the screen and she was patient when I wasn't exactly sure where I was going." "The agent offered to take me to the gate which was appreciated"*.

Receiving a print-out of the travel information reconfirmed the travellers communications and puts them at considerable ease. In a recent travel experience, a traveller with a hearing impairment asked for a 'meet and assist' service on her return trip since she was transfering between flights at an unfamiliar airport. When the traveller arrived at the unfamiliar airport, there was no one there to meet her and she felt very uneasy navigating her way through the terminal to another terminal. It is not known whether her request ever got placed into her file or if the airline just missed the request. It is recommended that check-in agents offer the service of printing out the flight itinerary for travellers and any special requests that the traveller may have made.

From Check-In to the Gate. One of the biggest frustrations to travellers with hearing disabilities is that not enough conscious effort has been put into creating visual information systems for them to identify flight changes, boarding announcements, or when their name is being called over the public address (PA) system within a terminal. Even those individuals who have some residual hearing often cannot understand the announcements over the PA system because of the high background noises in the terminals and would prefer a clearly-visible and easily-readable information system. (Comments were made that announcements, if individuals could hear them, were most intelligible in the washrooms.)

The participants strongly recommended larger visual display systems with indicating flashing lights to announce either boarding was in progress or a flight was delayed. Otherwise, the hearing-disabled group had expressed no trouble in getting in and around the airport. The maps were considered to be clear and they felt that the agents and security were helpful in

indicating the correct direction to go. This group did not experience any difficulties going through security. If a traveller with hearing disabilities has to go through customs, they generally communicate on paper so that any head nodding is not inadvertently misinterpreted.

During the simulation scenarios, two of the three travellers had good experiences at the gate. Some travellers had "Deaf Passenger" written on their ticket which they felt alerted the gate agent to warn them when the boarding time approached. The third traveller had a poor experience at the gate. They did not tell the agent at the gate that they were deaf, because they had been told by the ticket agent that the gate agent would be aware that they would be travelling on the flight and would take care of them. This particular traveller was not pre-boarded and in fact the plane left without them even though they were sitting in view of the gate agent. The travellers comments were: *"I think they should make better arrangements to make sure the gate agent knows there will be deaf people on board. They should also know where TDDs are available"*.

Participants in the focus group had experienced problems in the past when more than one flight was departing from proximate gates and it wasn't clear from the signage which flight was leaving from which gate. It was recommended that a visual display sign over the gate doorway should flash the destination when the flight is boarding in addition to visually announcing which rows are being seated.

Travellers with hearing impairments generally do not like to be singled out and prefer to move with the crowd. But if they have no visual clues to tell them what is happening, this is rather difficult.

On-Board the Aircraft. Travellers with hearing disabilities have seat preferences similar to those of other travellers. Some prefer window seats because they can look out the window and read undisturbed, others prefer aisle seats to stretch their legs and because it is easier to communicate with the flight attendant. Some individuals have a definite preference for sitting either on the right or left-hand side of the airplane because they can hear better with one ear or the other. None of the participants felt comfortable when sitting in the middle seat.

Conventional information systems such as the PA system and the on-board safety card do not meet the needs of the hearing-impaired. Travellers who are hard of hearing or hearing-impaired are often excluded from the PA system information and the information cards were considered poor substitutes for explaining emergency procedures. Flight attendants attempt to fill this gap, but this depended on the attendant's perception of the needs of the traveller and the attendant's preoccupation with other needs.

Previously, a Canadian airline used open caption video explaining flight information procedures. The open captioning, however, was relegated to

the lower corner of the screen making it difficult to see. Two close captionings are also required (one for each official language). Although it has been suggested that airline passengers pay more attention to in-person flight attendant demonstrations than video presentations, Air Canada has developed a new video on safety measures with a 'visual' message that was successfully tested with individuals at a hearing-disabled institution.

For inflight announcements, the focus group participants felt that the communication gap could be easily overcome with a visual PA system using conventional text (rather than sign language as most hard-of-hearing travellers are not conversant in sign language). It is not sufficient to have a pre-recorded tape since the captain frequently makes in-flight announcements which can not be pre-recorded. It was recommended that an in-flight visual system be developed which would convert verbal announcements (through voice recognition or keyboard input) to text displayed on the video screens. Apparently, New Zealand Airlines have such a system where all the announced information is presented and up-dated on the video screen (interrupting the movie if it is in progress) displaying such information as flying altitude, speed, anticipated arrival time, time changes, temperature, meal choices, delays, etc.

Upon Arrival at Destination. Travellers with hearing disabilities sometimes experience confusion trying to locate their luggage when they are in the actual luggage area. Reasons put forth include: flight indicator signs still show the arrival of a previous flight and have not yet been changed to the new arriving flight, or the sign only shows the flight number and not the departure city. This is quite disconcerting to the traveller. Often arrival of flight luggage is announced on a PA system identifying the correct carousel/belt. Once again travellers with hearing impairments are excluded from hearing these announcements.

What creates the most anxiety amongst travellers with hearing disabilities is missing a connecting flight due to a flight delay. In most cases, airports either do not have TDD's or, if they do, no one from the airlines can find them. It is important for travellers to have access to TDD's because they may have to advise people at their destination about the delay and the TDD is the only way of communicating this information. It is essential that airports have a TDD to meet the needs of these persons and to decrease the panic that they experience in such instances.

Moving About the Terminal. Persons with hearing impairments have no more or less trouble finding their way around smaller or larger airports than other persons. This is because, in general, no one relies on their hearing to find their way through an airport terminal. However, during the focus group session it was strongly recommended that auditory announcements be converted to visual displays and the visual information systems in use today at airports be larger and easier to understand.

Travellers with Cognitive Disabilities

Due to the difficulties inherent in defining and selecting persons with cognitive disabilities, persons with learning disabilities were selected for this focus group. There are 19 different learning disabilities. Often these individuals have a combination of three or four of learning disabilities. The severity of the disability may also vary from individual to individual. All participants in the learning-disability group had air travel experience. In most instances, they had made their own travel arrangements and had completed their travels unaccompanied.

Making Travel Arrangements. Individuals with learning disabilities utilize the services of both airline flight reservation and travel agents. Most of the participants experienced no difficulties making their flight arrangements provided that they had enough time to write down all the necessary travel information and read it back to the agent. None of the participants had encountered an agent who had attempted to curtail their conversation.

During the focus group discussions, it became apparent that persons with learning disabilities experience problems mainly with orientation. However, none of the participants had ever identified their disability while making reservations, even if assistance from check-in to the boarding gate or upon arrival were desired in the larger, disorientating, unfamiliar terminals.

Checking In at the Terminal. Persons with learning disabilities have "learned to mistrust their perceptions". They never feel very confident that they have the correct information or are going in the right direction. Hence, during check-in, although no problems were experienced in actually getting the ticket, they have a tendency to want to confirm everything.

The following quotes exhibit what happened at the airport during the simulations: *"I went to the wrong counter, but the airline agent was helpful in putting me in the right direction." "I had no problem in getting my ticket."* Instructions provided were not always clear. *"The agent told me the gate number but not where the gate was located." "I didn't know why I had two boarding passes. She should have explained that to me." "I didn't realize I had to go to the gate immediately ... also, the agent didn't clue into the fact that I was having difficulties even when I took out my note pad to write". "The agent circled the time to board whereas I thought that meant the gate ... she should have told me". "The agent was getting impatient with me when I didn't understand what she was saying. This made me nervous."*

None of the cognitively-disabled participants left the check-in counter feeling confident and in control. This could have been avoided if the agents had shown more patience or could have advised the individual to ask for assistance from a customer service agent or an information officer.

All travellers occasionally use their airplane ticket to identify the flight number and the departure time. Some participants in the group had great difficulties deciphering the information on their ticket while others could not understand it at all. The numbers were confusing because *"... they didn't line up with the lines on the ticket." "There was nothing on the ticket to tell me when I was arriving in Calgary".* The boarding passes were much better because the lettering was larger and they contained more pictograms. Most of the travellers said they relied on their written itineraries when they travel rather than the information on the ticket. To ensure that the traveller has the correct information and to speed up the process at the check-in counter, it would be useful if the airlines offered a printout of the itinerary possibly with a map identifying the gate location.

From Check-In to the Gate. One of the greatest concerns for a person with learning disabilities is orientating themselves in a large, busy environment. Learning-disabled individuals easily get confused, and this confusion is intensified by background noises, incomprehensible signage, and time pressure stresses. Because of the high background noises in an airport, most travellers have difficulty understanding public address (PA) system announcements. The learning-disabled group found the announcements were incomprehensible and therefore just added to their stress levels when trying to get to their flight. In terms of managing their way from the check-in counter to the boarding gate, most participants were confused by existing signage. For example, abbreviations and gate locations, such as for Gate 15, many travellers with learning disabilities are not sure when they see a sign saying 'GATES 1-20', if gate 15 is actually between number 1 and 20.

To assist them in their direction-finding, travellers with learning disabilities will often look for an information booth. In Vancouver, travellers had difficulty locating the information booth because it was not easily identifiable and the sign signifying its location could only be read from one direction. It was suggested that information booths be labeled with a "?" in addition to the word 'Information'. Furthermore, the booth signs should be easily identifiable upon entering the airport terminal and directions to the booth should be easily seen from all other check-in counter points.

The only concern about security was that with all the noise and people, disorientation and forgetfulness are common. *"Security was really disorienting ... the alarms and people really made me confused".* Consequently, travellers forget the gate they are looking for, and how much time they have to get to the gate, consequently they start to experience symptoms of stress and sometimes panic. *"Nobody told me to remember to pick up my bags and change at security ... there was so much noise that I got confused."* Solutions include reducing the noises in the area, having a flashing sign reminding people to take their bags, pocket change, camera, and having footprints or arrows pointing to the gates.

Exhibit 26: Problems with Information Systems

TYPE	CONTENT	TASKS REQUIRED	PHYSICAL DISABILITIES
Planning	Comprehensive information	Acquire information	No particular problem
	Specific information	Understand information	No particular problem
	..ıdividual information	Make a trip plan	No particular problem
	Special service information	Determine needs	Finding what is available in terms of accessible features and facilities
	Detailed trip information	Make a reservation	Communicating any special needs, attendant, wheelchair, seat selection requirements to the agent
Terminal	Access to terminal	Go to terminal	Finding information officers knowledgeable about access options
	Information availability	Find assistance	Generally, little problem
	General information	Follow directions	Generally, no problem
	Directions in terminal	Find way	Generally, no problem
	Instructions in emergencies	Follow procedures	Understanding PA announcements
	Information on special services	Use facilities	Accessible facilities generally available, except in smaller airports
	Directions for ticket purchase	Obtain ticket	Generally, little problem
	Directions for baggage handling	Check baggage	Usually, just problems with communicating needs for wheelchair
	Information about flights/times	Use visual displays	Height of video displays a problem
	Information about boarding	Ask for assistance	Variability of assistance with wheelchair handling and storage, esp. related to battery handling/storage
	Indication of boarding locations	Find direction/gate	Generally, little problem
	Directions for boarding/departure	Board vehicle	Need pre-boarding assistance which depends to a great extent on the training of the attendants
Onboard	Instructions for services	Find seat and use facilities	Need for reliance on the training/understanding of flight attendants with respect to passenger needs
	Instructions for emergencies	Understand procedures	Obtaining special information related to procedures for passengers with physical disabilities
	Instructions for customs	Fill out forms	Generally, little problem, except for persons with agility difficulties

PROBLEMS ENCOUNTERED BY PERSONS WITH		
VISUAL DISABILITIES	HEARING DISABILITIES	COGNITIVE DISABILITIES
Usually only available in printed, not in audio, format	Generally, little problem	Generally, little problem
Timetables/schedules not useable	Generally, little problem	Difficult, like many people, to understand complex schedules
Finding out about available alternatives for trip	Generally, little problem, except for lack of available TDD's	Understanding the alternatives
Special service brochures may not be available in audio format	Obtaining information on special services without self-identification	Obtaining information on special services without self-identification
Communicating any special needs, especially wrt guide dogs	Making reservation in person to avoid misunderstandings	Making sure information is written down (trip itinerary) and correct
Requires friend/relative or taxi driver to provide assistance	No problem, usually	May require friend or relative to provide assistance
Information booths not consistently located, lack of information phone at entrance of terminal	Just general lack of information booths and assistance	Signage and way-finding cues are not always consistent and understandable
Usually, no tactile/large print or audio casette orientation aids	Generally, little trouble	Problems of orientation always encountered in large, busy environments like transport terminals
Lack of high colour/contrast signs, tactile signage, textual surfaces, other way-finding cues	Generally, little trouble experienced in finding way through terminal	Lack of pictograms, understandable signage and way-finding cues
Hearing PA announcements	PA announcements need to be available in visual format	PA announcements are usually incomprehensible
Usually, require knowledgeable agent provide assistance	Finding out about special services without having to self-identify	Finding out about special services without having to self-identify
Requires knowledgeable/sensitive agent and/or attendant	Just problems sometimes in communicating with agent	Problems occasionally in communicating with ticket agents
May have trouble identifying baggage to assisting agent	Problems only if PA announcements used to identify baggage location	General problem of orientation in a busy environment
Video monitors too high, words too small and lack of contrast	Little problem with visual displays	Video displays of flight schedules are difficult to comprehend because of abbreviations, nomenclature
Lack of proper training of security personnel re guide dogs, assisting	Communicating with carrier and terminal personnel (esp changes)	Security is generally a disorienting experience, lack of visual cues
Lack of way-finding cues such as textual surfaces	Generally, little problem	General lack of way-finding cues, such as colour coding like maps
Generally, little problem with appropriate pre-boarding assistance	May not hear pre-boarding announcements and if not self-identified may experience difficulties	Difficult to obtain assistance without self-identification of a problem
Trouble identifying features and facilities with personal explanation by attendants	General lack of visual information, PA announcements not in video or visual format	Need visual information to augment audio information that is received
Identifying exits doors/procedures without personal explanation and description	Safety explanations difficult to understand, unless highly visual like Air Canada's new video	Difficulties understanding safety cards, need visual information to augment audio announcements
Cannot fill out forms without assistance	Need to write down questions and answers to avoid misunderstandings	Difficulties reading/understanding, filling out forms and procedures

None of the individuals in the learning-disabled group experienced any problems once they arrived at the boarding gate. They could generally follow the boarding procedure, observe other passengers' behaviour and proceed appropriately.

On-Board the Aircraft. Travellers with learning disabilities experienced difficulties understanding safety cards. Some travellers pick up information more easily verbally, others visually. To meet these needs, it was suggested that safety cards have both diagrams/photos and a few explanatory words. Many participants also expressed difficulties identifying their seat numbers. They felt that often the information displays are too small and unclear whether A or C is the aisle or window seat. A traveller with learning disabilities is very concerned about doing the right thing.

It has happened on occasion during a stopover that a traveller with a learning disability thought that they had arrived at their destination and disembarked. Similar to the comments made about the safety cards, individuals who rely on visual cues for picking up information would be greatly assisted by an on-board message display systems which they could read to confirm what has been announced over the public address system.

Upon Arrival at Destination. Some travellers with learning disabilities have difficulty with time concepts. For example, one month to some individuals is the same as one week. In terms of travelling this may be a problem when travellers have to connect with another flight and there is a lay-over of several hours. This problem is intensified when there are no clocks in hallways confirming local time and no departure announcement.

Similar problems of orientation in moving through the terminal are expressed by travellers with learning disabilities trying to find the baggage claim area. It was suggested that better signage and methods of way-finding are required to assist persons with learning disabilities.

Moving About the Terminals. Problems for travellers with learning disabilities multiply when the airport is large, noisy and confusing. Focus group participants suggested that there should be more pictograms for communication of way-finding information. Floor arrows would assist in directional finding. Participants also felt that an information booth(s) would be most helpful. This way, they would not feel like they were holding up the check-in agent and the other passengers.

All of the travellers had some difficulty in understanding the video display screens for flight arrival and departure information, especially abreviations.

When asked to rate the ease of mobility around the airport, one participate found that it is was adequate. Two participants found that it was fair.

CONCLUSIONS

Travellers with recognizable disabilities are more open to express their needs which makes it easier to assist them than those with less visible disabilities. The amount of assistance required by a traveller is a function of the severity of their disability. It cannot be emphasized enough that one of the main travel information systems that needs to be improved is the knowledge of the airline and rail personnel in the handling of the variable needs of the passenger with disabilities. Key to this training is to allow travellers with disabilities to express their needs without making assumptions about what the traveller requires and to recognize the needs of inexperienced travellers who may require extra assistance.

There are many problems with existing traveller information systems that are common to one or more disability groups. Improving the information systems for all persons with disabilities will result in improved travel for all travellers.

6. RECOMMENDATIONS

During the course of the research on this project, several major issues surfaced that need to be addressed when assessing traveller information systems. The issues relate to perceived deficiencies in existing policies and guidelines, research and understanding, technology testing and development, procedures and practices, personnel training and public education. The recommendations addressing the issues are relevant to:

- Development of more flexible policies for assisting and handling travellers with disabilities, particularly as they relate to airplane seating and carrier classification and assistance of travellers.
- Investigations, research, and information-generating activities to provide a better data base on the format, media and content of information systems for travellers and a better data base on the use of such systems by travellers with disabilities.
- Testing and development of augmentative information systems, particularly the visual display of auditory messages in both vehicles and terminals and the use of auditory and tactile information systems for visual information displays.
- Human factors research and analysis of current procedures and practices, particularly as they relate to provision of instructions and information and safety orientations on-board the vehicle.
- Improvement of training and education, particularly as it relates to travel guides for persons with a disability and training for carrier personnel who are called upon to assist them.

The issues are discussed in greater detail and the resulting recommendations are outlined in the following paragraphs of this chapter.

POLICIES AND GUIDELINES

The interiors of most transportation vehicles are designed to make efficient use of the available space, resulting in narrow aisles and closely-spaced seats which hinders movement. Large aircraft generally have controlled seating. There is considerable differences in opinion as to the proper seating policy toward persons with a disability. Specific issues are: whether or not disabled persons should be grouped in a specific area, seated or not in exit doors and limited in number.

In 1977, the United States Federal Aviation Administration studied the problem extensively using a tiltable aircraft evacuation simulator and presented several significant observations (42) which are summarized in the following statement related to the seating procedures for passengers with a disability: "In the case of emergency evacuation the placement of such passengers is crucial. If they are at the exit there is the possibility of hindering the fast flow of the general passenger load in exiting. If, on the other hand, they are seated too far from the exit, personnel must lose time (which may not be available) in getting them to an exit. Yet, in actual emergency evacuations, one or more exits are not operational. Further passenger panic seems to be the norm rather than the exception. The emergency evacuation of disabled groups needs to be studied and effective exit procedures developed under such conditions" (43).

To handle this situation, Transport Canada has adopted guidelines for the maximum number of non-ambulatory passengers that may be safely transported on any flight. While these numbers are based on the research by the Aeromedical Institute of the U.S. Federal Air Administration, they take into account the type of aircraft, availability of controlled seating, whether the non-ambulatory passenger is accompanied by an attendant, potential assistance from fellow passengers and the special abilities of 'wheelchair athletes'. While the numbers have evolved from industry consultation and have achieved a considerable degree of acceptance, they can still be criticized by various advocacy groups as subjective values. Some other issues, however, such as the carriage of guide dogs are still unresolved.

"This general approach of dealing with evacuation safety problems through the establishment of limits appears to be reasonable. However, the actual numbers and the underlying assumptions should remain under critical reassessment and be open to revision in either direction by Transport Canada" (44). In order to provide the safest environment for all passengers with equal evacuation opportunity, Transport Canada recommends that anyone lacking agility not sit near certain exits as they are difficult to use and that anyone requiring assistance to evacuate be behind the crowd, where there is space to maneuver, rather than in front. The carriage of guide dogs, both sight and hearing, presents a problem. Quantitative data regarding the dog's behaviour in a rushing crowd is not available to substantiate any decision to permit them in the cabin or not, although airlines do allow both hearing and seeing guide dogs in the cabin.

A special video presentation has been prepared by Transport Canada to help train aircraft cabin crew to provide the safest seating location and to explain the importance of seating to special interest groups, as a way of providing the safest environment for all occupants.

In spite of these efforts, there is still apparent problems, and the issue that arises is the question of satisfying the passenger's needs within the carriers policy guidelines. Sometimes, tradeoffs will have to be made; for example, a traveller with a wheelchair may wish to sit in a bulkhead seat and near the washroom. In this case, depending on the type of aircraft, the passenger should be made aware that a bulkhead seat may be preferable for a short trip and a seat close to the washroom may be preferable on a long trip. Another example is that of a traveller with visual impairments travelling with a guide dog; although a bulkhead seat may provide more room for the guide dog, it causes difficulties with respect to the traveller's comfort and control of personal belongings.

Satisfaction of the passenger's needs could also be done a more convenient manner. Frequent travellers who have well-developed preferences for certain seats and services should not necessarily have to spend time convincing reservation agents of their needs for each trip. This information could easily be stored on personal smart cards or within the computer reservation system next to other 'frequent flyer' data that may be stored on various passengers. To do so, however, would probably also require a better means of defining the passenger's needs then is currently available through the present IATA classifications.

To help solve some of these apparent problems and to resolve some of the issues that have been raised, it is recommended that:

Policy Recommendations

There be more flexible policies for assisting and handling travellers with disabilities, particularly as they relate to airplane seating and traveller classification and assistance:

- That there be greater flexibility in seat assignments for persons with a visual or hearing impairment (encouraging the reservationist to listen to the passenger and to point out the trade-offs that the passenger may have to make in determining the choice of seat).
- That travellers using a wheelchair be permitted in most cases to occupy the bulkhead seats (if at all possible) and that the traveller be informed of possible alternatives/consequences.
- That guidelines be developed and adopted for the carriage of guide dogs, hearing dogs and service dogs.
- That attempts be made to improve the IATA classifications of travellers with a disability to specifically include: individuals with visual, hearing or cognitive impairments and their special needs.
- That airlines consider the possibility of storing information in their computer reservation systems related to the special needs of frequent flyers with a disability.

RESEARCH AND UNDERSTANDING

A major problem in assessing current information and communication technology which may be available to meet the needs of persons with disabilities occurs due to lack of data on:

- The actual capabilities and limitations of disabled persons, including functional characteristics, that would be needed to cope with information systems or for which compensating features would be required.
- The number and distribution of disabled persons likely to be found on-board vehicles or in terminals to the degree necessary to determine the size and quantity of needed information/communication systems.
- The history or expectations related to the manner in which persons with disabilities interact with carrier personnel and other able-bodied persons in the transient and controlled situational environment experienced in transportation facilities (especially, persons with cognitive disabilities).

Much of the available information on disabled persons is provided in terms of physical or mental disabilities; whereas, to determine necessary information features for disabled persons, information is needed in terms of primary human response capabilities (sensing, understanding, and responding). In particular, there is a need for information on the individual's ability to move about in a crowded or controlled situation (such as going through security), the ability to hear and comprehend existing information, alarm and communication systems (such as public address systems), the ability to view and understand visual information (such as video display terminals) and so forth. Therefore, to resolve this issue it is recommended that:

Investigations, research, and information-generating activities be undertaken to provide a better data base on the form of information systems for travellers and a better data base on the use of such systems by travellers with disabilities, specifically:

- That additional 'real-world' studies be undertaken to provide a better data base on the capabilities and limitations of passengers with a disability dealing with information/communication systems; that is, additional, more detailed and comprehensive, closely-observed and documented travel simulation studies.
- That investigations be initiated into existing attitudinal barriers which are an impediment to full participation by people with disabilities and an impediment to full usage of, probably, the most important traveller information system: personal contact.
- That future studies also look at the problems experienced by carrier personnel when attempting to satisfy the needs of persons with disabilities within current policy and procedure constraints.
- That, in any future studies or projects on traveller information systems, the consultative process be encouraged and sustained. People with disabilities should have the opportunity to contribute to these studies on information systems.

Research Recommendations

TESTING AND DEVELOPMENT

Most large transportation terminals are low-rise buildings with one or two administration floors above one or two passenger floors. The departure and arrival levels are large open spaces with many people in close proximity. Transportation terminals with their unique design and usage characteristics present several unique problems:

- Information communication and dissemination is an issue due to the larger number of transient occupants and the higher level of activity and resulting noise that is found in transportation terminals. Especially important is the communication of emergency instructions.
- The location and type of information/communication systems, especially emergency warning systems, may hamper or preclude their use by individuals with visual or hearing impairments.

Certain types of disabilities hinder an individual's ability to perceive and evaluate a situation, due either to sensory or cognitive disabilities, or to a lack of information about the facility. Communication of information both before and during an event is a key to event-coping behaviour. Positive action in an emergency, for example, is based upon obtaining and evaluating information about the nature and extent of the problem. Without this understanding, travellers may lack the confidence to carry out even the most basic emergency procedures. The basic issue here is the need for a higher level of information transfer, possibly using both verbal and visual modes, in order to give persons with disabilities the necessary information about the facility and the situation to assist them in making decisions.

Existing public address systems are often difficult to understand and are of little use to the hearing-impaired. They are also a problem for the visually-impaired and cognitively-impaired who put considerable reliance on the messages broadcast. Therefore, it is recommended that:

Technology Recommendations

Testing/development be done of augmentative information systems and devices which would allow for traveller event notification, and provision of instructions and information:

- That electronic variable message signs such as those used at sporting events be tested. These may be used for advertising and messages and could be programmed to provide concise and reliable information to occupants of terminals.
- That tests be undertaken of audio loop or infrared broadcast information systems for individuals that may have difficulty understanding standard public address systems (eg. Heathrow).
- That tests continue with personal communication systems such as Communicaid, an integrated communication system, and Transaid, a portable communication and translation aid.
- That tests be undertaken of audio-accessible visual displays, such as terminal information map displays (similar to talking signs) and that such displays incorporate enlarged tactile lettering.

PROCEDURES AND PRACTICES

In any transportation vehicle, there is a need to communicate information related to initial seating, meals and services, points of interest en route, possible changes in the trip, and especially safety/emergency briefings. The quality of the initial safety orientation has a direct bearing on safety in an emergency. In an airplane, a person's ability to locate and operate the emergency exit is a function of the quality of the pre-flight briefing.

The issue of passenger attention to safety information is important because there is evidence that passenger safety could be increased if passengers were more knowledgeable of what to do, and when to do it in emergencies.

Airlines have put considerable energy into their in-cabin briefing. Special captioned video, braille seat cards and tactile layout diagrams are all being used. These aids need to be critically evaluated as to usefulness in light of the fact that only a minority of visually-impaired persons read braille and a minority of hearing or speech-impaired are proficient in sign language. The question of the usefulness of safety briefings is compounded by the difficulty in capturing and holding any passenger's interest during the briefing. It is commonly thought that most passengers aboard commercial aircraft do not attend to either the oral presentation given by the flight attendant prior to takeoff of a normal flight, or to the passenger safety information card located in the seatback pocket in front of the passenger. There is a need, therefore, to investigate alternative means of providing emergency information briefings.

Safety orientations have to consider that not all passengers are able to see or hear the presentation. There is a need is to standardize specific orientation techniques to gain reinforcement from repetition and maximize effectiveness. There may also be a need to undertake separate orientation or simulation exercises for both the potential passenger and the cabin flight attendants. Therefore, it is recommended:

Human factors research and analysis be undertaken of current procedures and practices, particularly as they relate to the provision of instructions, information and initial safety orientation information for travellers on-board the vehicle.

- Safety information for passengers with visual impairments should include an individual, personal demonstration of features and facilities and orientation within the vehicle.
- Safety information presented in video on airplanes should be highly visual so that the message can be understood by passengers with hearing and cognitive disabilities without the need for a script.
- Consideration should be given to the presentation of simulated safety orientation exercises at airports and in airplanes, in a cooperative environment with Transport Canada, major carriers, and associations for persons with a disability.

Procedures Recommendations

TRAINING AND EDUCATION

Training of transportation personnel must continue as a high-priority because these employees must possess detailed knowledge of the equipment and procedures of their job gained through frequent rehearsal of terminal and vehicle procedures. They are usually the first contact with the travelling public and are the information system most relied on by travellers with a disability. Particular emphasis should be given to operators who deal with passengers who are elderly or disabled. These operators have to be sensitive to the needs of their passengers and be able to understand and meet those needs in a variety of situations and possibly unusual circumstances. This requires considerable understanding, compassion and training on the part of transportation personnel.

On the other hand, there is also a need for public education in the area of persons with a disability travelling on air and rail systems, directed at both the consumer. Potential travellers, as well as the carrier personnel, tend to be ignorant of the policies and alternatives that may be involved. Subsequently, brochures should be developed for both consumers and transport personnel, informing the reader of the existence and applicability of carrier and transport policy. The brochures, which in some cases are already developed, should be made readily available to the travelling public, along with other source books such as "Handi-Travel" by Cinnie Noble.

Public education and operator assistance is necessary to impact on the marketplace and to effect change. Consequently, it is recommended that:

Education Recommendations

Improvements be undertaken of education and training, particularly as it relates to instructional and background materials for both the individual disabled persons, and for those called upon to aid them:

- That all public carriers produce and distribute brochures similar to the VIA Rail and Air Canada "Special Services" brochures to alleviate misunderstandings on the part of both the transportation personnel and the passenger with disabilities.
- That reservationists be encouraged to ask potential travellers during the reservation procedure if the traveller has any special needs and that a manual or checklist of questions be prepared to assist the reservationists in helping to define those needs.
- That, in order to stimulate awareness and encourage positive attitudes towards people with disabilities, sensitivity awareness seminars be conducted on a more regular basis and that these be conducted by trained people with disabilities.
- That the Transport Canada report, "A Guide to Recognizing, Understanding and Assisting Travellers with Disabilities" (TP 3461), be reviewed, updated and widely disseminated.
- That certain designated transport personnel assisting persons with disabilites be encouraged to learn some basic sign language as a training requirement.

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Appendices

A. GLOSSARY OF TERMINOLOGY

Advanced Booking Charter (ABC): A round-trip flight carrying restrictions on the length of stay, with requirements for advance booking and deposit. ABCs are generally much cheaper than economy air fares.

Advanced Purchase Excursion (APEX): An international discount fare on regularly-scheduled air or rail fares requiring minimum/maximum length of stay and advance booking. No stopovers are permitted.

Air Add-on: A reduced air fare that cruise lines arrange to fly cruise passengers to the port of departure.

Alliance of Canadian Travel Associations (ACTA): A national organization with seven regional branches, representing virtually all segments of the Canadian travel industry.

Ambulatory: A person considered ambulatory is able to walk, board the aircraft unassisted (even if slowly with aids such as canes and crutches) and move about in the aircraft cabin unassisted. In many cases, ambulatory passengers might require a wheelchair for help to and from the aircraft. Unless a serious medical condition exists, ambulatory passengers are considered self-reliant.

Augmentative Systems: An augmentative information system would provide a visual display of auditory messages (for example, real-time captioning) or an auditory message of a visual display (for example, talking signs).

Bumping: A passenger being denied a place on a flight in spite of a reservation due to overbooking or overselling by the carrier, a practice designed to anticipate the number of no-shows for each flight.

Business Class: A class of air travel that goes under a variety of names; business class is usually located in a separate section in the aircraft and includes some extras such as free drinks and movies.

Canadian Institute of Travel Counsellors (CITC): A national association of travel counsellors. The CITC sponsors regular qualifying examinations that, combined with work experience, entitle those who pass to use the Certified Travel Counsellor (CTC) designation.

Canadian Transport Commission (CTC): Responsible for the regulation of transportation in Canada under federal jurisdiction, with the objective of coordinating and harmonizing all carrier operations under federal jurisdiction. The CTC is required to perform all functions vested in it by the National Transportation Act, the Railway Act, the Aeronautics Act, the Transportation Act and other statutes.

Captioning: A means of making television programs accessible to persons who are deaf or hard of hearing. Open captions are transcripts of the dialogue printed on the screen and similar to subtitles for foreign language films. However, technology has made it possible for viewers with special cable decoding equipment to receive captioned messages at the bottom of their picture where other viewers would see only the program -- this is known as closed captioning. A third method is to superimpose an insert of a sign language interpreter in the corder of the screen (a customary method for broadcasts from the House of Commons). Real-time captioning is a recent advance and opens a new range of information accessible to persons with hearing impairments. Canadian technology provided real-time captioning to the coverage of the Olympic Games.

Charter Flights: Similar to Advanced Booking Charter, with similar restrictions, but offered on a regular basis.

Close Captioning: A means of making television/video programs accessible to persons who are deaf or hard of hearing. Viewers with special cable decoding equipment receive captioned messages or subtitles at the bottom of their picture where other viewers would see only the program.

Communicaid: A system of integrated communication aids for persons with sight, speech or hearing impairments, suited to the needs of travellers and carrier agents in transportation terminals (developed by Rutenberg Design Inc. for the Transportation Development Centre).

Communication Aids: A number of communication aids for persons with sight, speech or hearing impairments are available commercially; for example, Canon Communicator, Texas Instruments Vocaid, Form-A-Phrase, and other printed or electronically digitized speech aids.

Direct Flight: A flight between two points in the same aircraft, but with touchdown(s) in between (see also Non-stop Flight).

Domestic Charter Class Fare: Not to be confused with charter flights, an excursion fare available on scheduled airlines for travel within Canada between points at least 400 miles apart. It requires thirty-day advance booking, seven-day full prepayment.

Economy Fare: The airlines' basic fare level, frequently buried in the mountain of special, discount and charter fares that are now available.

Excursion Fare: A lower fare for round-trip travel, usually offered by carriers to boost demand for certain routes or times of the day, week or year. The fare operates with a variety of restrictions and can be applied to certain flights or a limited number of seats on certain flights.

Family Fare: A discount fare for members of one family travelling together in Canada. One adult pays full fare; the remaining family members pay some portion of it.

First Class: The airlines' highest-priced fare, a luxury service with larger seats, champagne, real cutlery, etc.

Incapacitated: Passengers are defined as "incapacitated" or "disabled" when their physical condition or medical disorder (including mental illness) requires airlines to give them individual attention (on enplaning and deplaning, during flight, in an emergency evacuation and during ground transfers at airports) which is not normally extended to other passengers. This definition covers not only those who are medically ill or temporarily disabled whose condition is considered to be variable and who require medical clearance prior to each trip, but also those permanently disabled persons whose condition is stable. **Note:** The airline retains the authority to refuse the transportation of ANY passenger whose condition, in its opinion, would jeopardize his or her own well-being or that of other passengers.

Inclusive Tour Charter (ITC): A round-trip tour organized by a tour operator, which combines air transportation, land services and accommodation in the price.

Interline: A transaction involving two airlines or cruise lines. Interlining most often refers to transferring airline tickets between two carriers serving the same route. This is usually possible on full Economy Fare; difficult or impossible with APEX, Excursion, ABC and other reduced fares.

Load Factor: The percentage of seats occupied on an aircraft.

Loop Systems: A system in which audio information is fed through an amplifier into a loop of wire which is embedded in the floor and surrounds the proposed area of reception. The audio information is received in amplified mode by the individual through a personal receiver, usually attached to the ear. A hearing aid with a 'T' (for telephone) switch is an ideal receiver for the Loop System.

LRC: Light, rapid, comfortable; VIA Rail Canada's newest rolling stock, which incorporates many features to improve accessibility.

Mental Handicap: Definition used by many airlines. Mentally handicapped persons who are accompanied are accepted if they will not affect the reasonable safety and comfort of other passengers. Unaccompanied mentally handicapped passengers capable of self-care are accepted.

Non-Ambulatory: Persons who are non-ambulatory are unable to walk and board the aircraft unassisted, and cannot ascend or descend steps. They require a wheelchair to and from the aircraft or mobile lounge, must be carried up and down steps, and are unable to walk from the aircraft door to the seat and to the toilet. Persons classified as non-ambulatory are considered self-reliant unless a serious medical condition exists.

Non-Self-Reliant: Anyone who is incapable of self-care during a flight. This applies to those with physical, medical or mental conditions requiring individual attention not normally extended to other passengers upon enplaning and deplaning, during the flight, in an emergency evacuation and during ground transfers. A non-self-reliant person requires an attendant.

Non-Stop Flight: A flight between two points, on the same aircraft, with no stops in between. Different from Direct Flight (see above) which may have touchdowns (stops) in between.

Open Captioning: Open captions are transcripts of the dialogue of a television program or video printed on the screen for persons who are deaf or hard of hearing and similar to subtitles for foreign language films. Real-time captioning of news programs and other events is becoming more common and more feasible.

Openjaw: Similar to round trip, except that the point of departure and point of return are not the same.

Overbooking: Accepting more reservations than places available to account for expected no-shows.

Package Tour: A vacation in which transportation, accommodation and often meals and activities are offered under one total price.

Qualified Personal Attendant: An able-bodied individual who is technically competent and physically able to assist a disabled passenger to an exit in the event of an emergency, who will attend to the personal needs of that passenger during the flight.

Reading Machine: Such as the Kurzweil Reading Machine, which provides personal, direct access to printed information for persons with visual or learning disabilities. An optical scanner connected to a computer converts printed material into synthesized voice output.

Reconfirmation: To be done by the passenger at least 24 hours prior to departure. On international flights, failure to advise the airline of your intention to use the reservation within 72 hours of the departure could result in cancellation of the booking.

Round Trip: A trip with the ultimate destination and point of origin being the same, and travel in both directions by the same route.

Seat Sale: Periodic discounting of a limited number of seats on certain routes or flights..

Self-Reliant: Disabled passengers who are independent, self-sufficient and capable of taking care of all their physical needs in flight are considered self-reliant. These passengers require no special or unusual attention, except perhaps assistance in boarding and deplaning. Generally, airlines will accept a passenger's statement of self-reliance with the knowledge that a disabled person is well aware of his limitations and acts accordingly. Some, however, request medical confirmation.

Senior Citizen Fare: Discount fares for people who fulfill the airlines' age requirement; usually 65 years of age or over.

Stopover: A 24-hour or longer interruption of an international journey, allowed with certain air fares and not with others.

Talking Signs: The system utilizes an infrared light beam which is modulated with audio information. Typically, a light beam transmitter will be associated with, and adjacent to a standard visual sign and the audio message will be the contents of the sign, hence the name 'Talking Sign'. The receivers convert the modulated light back into an audio message for persons with visual impairments.

Transaid: A portable communication/translation aid for persons with speech or hearing impairments, or who cannot speak French or English suited to the needs of travellers and carrier agents in transportation terminals. It consists of a touch screen and speaker to both the traveller and the agent with a series of menus for questions and answers (currently being developed by Rutenberg Design for the Transportation Development Centre).

Two-For-One Fare: Offered to disabled passengers travelling with an attendant; an escort travels free if he or she agrees to help the passenger with boarding and deboarding, and during the journey as required. The fare is offered for rail and bus travel only; proper identification is required. Also referred to as "one person, one fare".

Visual Ear: A telecommunications device for the deaf (TDD) and persons with speech impairments which uses a standard typewriter keyboard with one-line LED message and can be interfaced with a regular telephone if the other end is equipped with a similar device.

WCHC -- C for cabin seat: These passengers are immobile; they require a wheelchair to and from the aircraft, and must be carried up and down steps and to and from the cabin seat and toilet, and need assistance to take care of their physical needs in-flight. They are considered non-self-reliant and require a personal attendant. In Canada, on certain airlines, the attendant's fare will be reduced.

WCHP -- P for paraplegic: This is a strictly Canadian classification, referring to a passenger who is immobile but self-reliant during a flight. A wheelchair is required to and from the aircraft, and the person must be carried up and down steps and to and from the cabin seat. This passenger is capable of taking care of all physical needs in flight. He or she will have taken precautions to avoid the necessity using the aircraft washrooms and requires no special attention, except on boarding or deplaning, beyond that afforded to the general public. This passenger may travel without a personal attendant in accordance with approved numerical restrictions.

WCHR -- R for ramp: This classification includes persons who are ambulatory, that is they can walk; board the aircraft unassisted (even if slowly) with walking aids; and move about within the aircraft cabin unassisted. Wheelchair assistance may be required for long distances, i.e. across ramps as applicable. Blind, deaf and mentally handicapped persons are usually included in this category. Elderly people requiring minimal assistance, such as the use of a wheelchair for distances, are also included in this category. WCHR passengers are considered self-reliant unless a serious medical condition exists. No restrictions are imposed by Canadian airlines on the number allowed on each flight.

WCHS -- S for steps: Persons classified as WCHS cannot ascend or descend steps but are able to make their way to and from cabin seats. A wheelchair is required to help them to and from the aircraft and they must be carried up and down stairs. They are considered self-reliant unless a serious medical condition exists. No restrictions are imposed by Canadian airlines on the number of WCHS passengers allowed on flights.

B. CHARACTERISTICS OF THE MARKET

Statistics Canada is in the process of developing a national database on disability, using the results of two recent surveys: the Canadian Health and Disability Survey and the Health and Activity Limitation Survey.

Conducted in October 1983 and June 1984 by Statistics Canada as a supplement to the Labour Force Survey, the Canadian Health and Disability Survey provided accurate data on the numbers and characteristics of persons with disabilities in Canada. The survey covered 65,800 households; 15,854 adults and children were identified as having some disability. Still lacking, however, were complete data on the institutionalized population.

Most of the deficiencies with the data from the Canadian Health and Disability Survey were corrected with the results of the Health and Activity Limitation Survey. This survey was a follow-up to the 1986 Census of Population by Statistics Canada. It was the largest survey of its kind in Canada involving approximately 120,000 adults and children, including long-term residents of institutions and other health-care facilities.

The information from the Health and Activity Limitation Survey is currently being correlated with that from the Canadian Health and Disability Survey and the 1986 Population Census -- creating a data base of unparalleled information on the number, demographic and other characteristics of Canadians with disabilities.

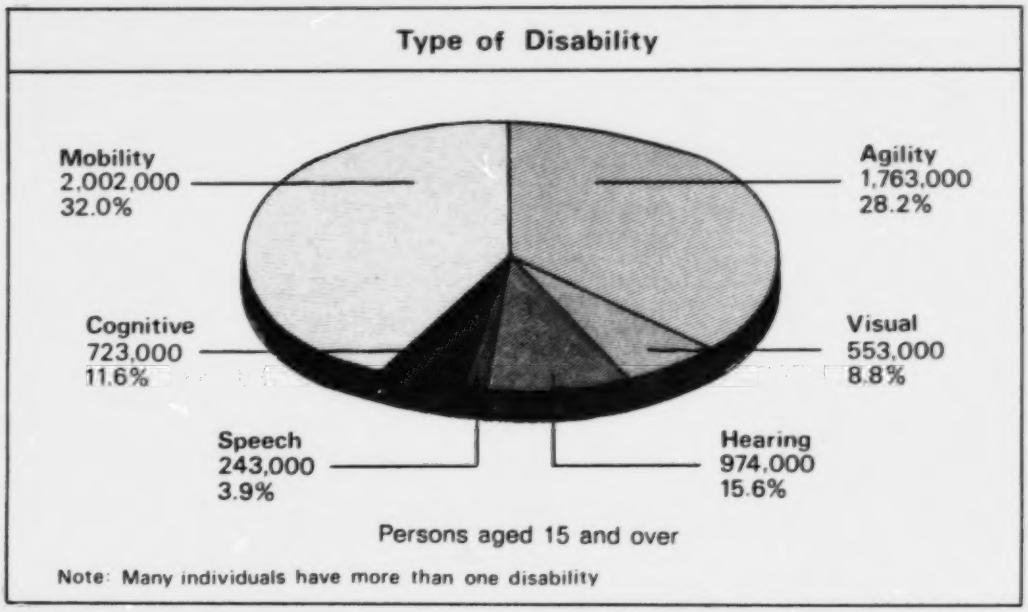
A review of what is currently known about the incidence of disability in Canada is provided in this appendix: the numbers, types and causes of disability, and the education, employment, income, travelling habits and transportation limitations experienced by Canadians with disabilities.

DEMOGRAPHIC CHARACTERISTICS/POPULATION

Disabled Population by Type of Disability

Over 3,300,000 Canadians, 13.2% of the population, reported some level of disability. Canadians with disabilities cannot be treated as a homogeneous group. They are affected by various types and degrees of disability and many have more than one disability.

According to the Health and Activity Limitation Survey, two-thirds of all disabilities experienced by Canadians 15 years of age and over are related to physical aspects (mobility or body movements); 28.3% are related to sensory aspects (seeing, hearing, speaking) and 11.6% to other (cognitive).



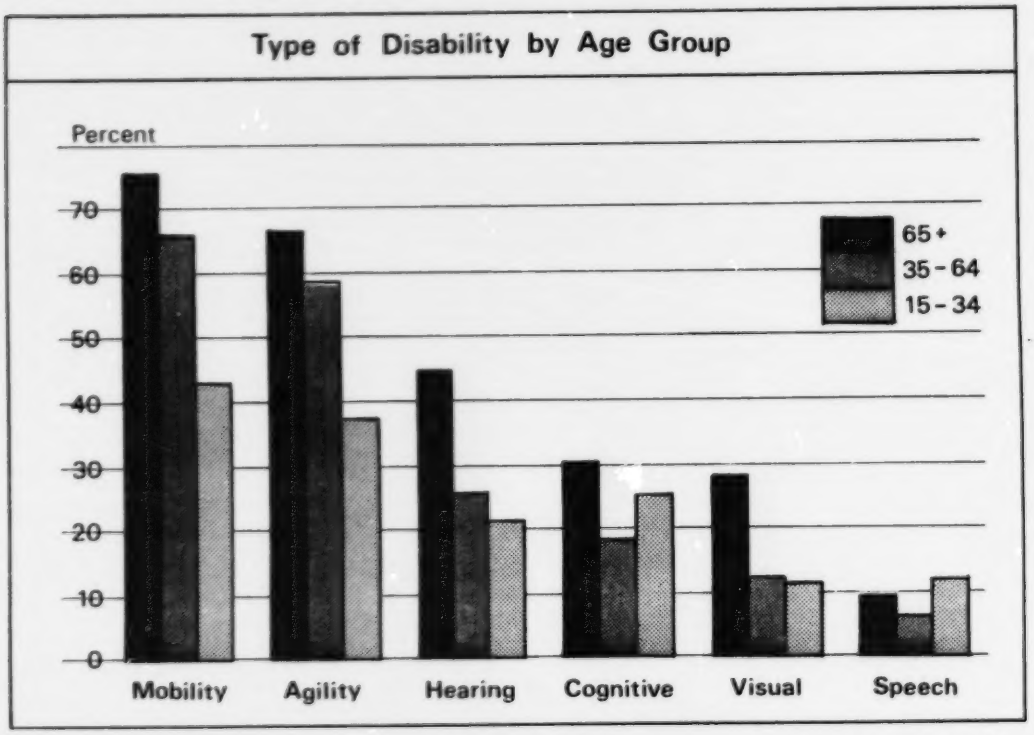
Disabilities relating to physical mobility (i.e, walking and moving about) or agility (e.g., reaching for things) accounted for 60.2% of all disabilities. Mobility disabilities accounted for 32.0% of all disabilities and were reported by 2,002,430 persons aged 15 and older. Agility disabilities were reported by 1,762,870 persons or 28.2% of all reported disabilities.

Sensory disabilities account for 28.3% all disabilities: hearing disabilities by an estimated 973,830 in Canada or 32.0% of the disabled population, of whom 168,000 cannot hear a conversation over a standard telephone, even with the use of a hearing aid. About 553,000 persons, or 18.2% of those reporting a disability, are visually impaired. Of these, about 10.2% are legally blind. Difficulties with speaking are less common: about 52,000 persons are completely unable to communicate with people other than family and friends, while a further 146,000 experience some difficulty.

Cognitive disabilities (learning, emotional or psychiatric disability, or developmental delay) were reported by about 723,380 persons or 11.6% of the disabled population aged 15 and older. No breakdown is available as yet from the Health and Activity Limitation Survey on the different types of cognitive disabilities experienced by disabled persons.

The prevalence of disabilities varies according to age and sex; women report higher rates of mobility, agility and visual disabilities than do men, while hearing and speech impairments are more common among men. Just under 43% of the disabled persons aged 15 to 34 reported a mobility disability, compared to over 75% among disabled seniors aged 65 and older. Eleven out of every 100 disabled Canadians reported a seeing disability, where 27 out of every 100 disabled seniors reported such a disability. Hearing disabilities rose from 20 out of every 100 aged 15 to 34 to 45 out of every 100 seniors aged 65 and older. According to the Canadian Health and Disability Survey, cognitive disabilities remain relatively constant across all adult age groups until age 65 and then rises.

Type of Disability by Age Group



Two-thirds of the disabled population aged 15 and older reported having more than one type of disability. One-third report having three or more disabilities. Not surprisingly, the prevalence of multiple disabilities increased with age; in the disabled population aged 15 to 34, 45.5% reported having more than one disability, increasing to 62.5% in the population aged 35 to 64 and 76.0% in the population aged 65 and older.

FUNCTIONAL CHARACTERISTICS/LIMITATIONS

Activity Participation and Limitations

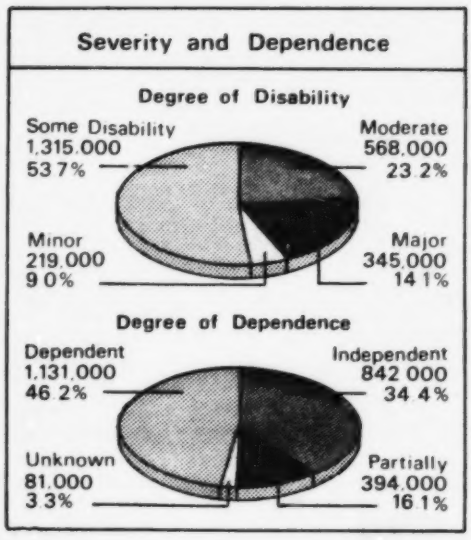
For the purpose of the Statistics Canada national database on disability, a functional limitation approach was used for the adult population aged 15 and over, through the use of "Activities of Daily Living" questions. Those individuals unable to perform one or more of 17 activities, such as walking up and down a flight of stairs, dressing and undressing themselves, and cutting their own food were considered disabled. For children under the age of 15, a general limitation approach along with a list of chronic conditions and a list of technical aids was used.

Over 8% of disabled seniors residing in households reported never participating in activities outside their home. Of those who did, 88.2% visited friends and 84.0% went shopping at least once a month. Attending religious activites or doing volunteer work was the third most frequent category with 50.1% of the disabled reporting these activities.

Almost 25% of these disabled seniors indicated that they were not satisfied with the amount of activity they participated in outside their residence. Of those, 172,295 reported that they were physically unable to do more while 49,240 stated that they could do more if they had someone's help. High costs, location too far, and inadequate transportation were other reasons given for not being able to do more activities outside the home.

Degrees of Disability and Dependence

With respect to the degree of disability, the Canadian Health and Disability Survey identified 14.1% of disabled Canadian adults as having a "major" disability, i.e. they are unable to perform three or more of the 17 activities of daily living, such as walking up and down a flight of stairs, dressing and undressing themselves, and cutting their own food. "Moderately disabled" persons, i.e. those who cannot perform one or two of the activities, total 23.2%; and 53.7% have "some" disability -- able to perform all of the activities.

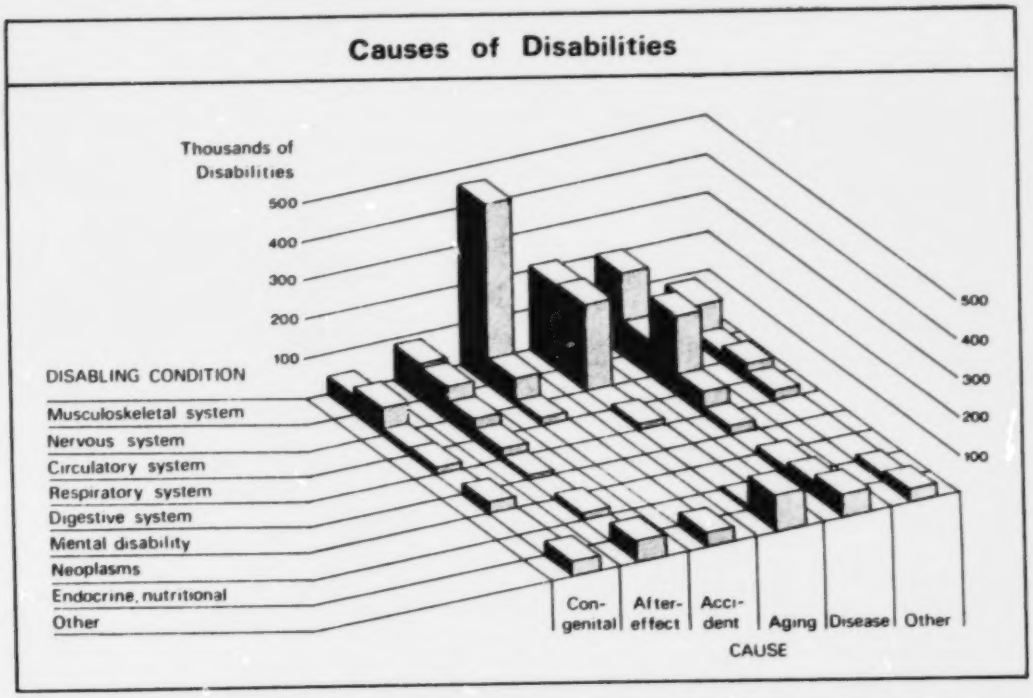


About 1,131,000 adults with disabilities require assistance to perform household chores, go shopping, go out or do housework, or move around inside the home or provide self-care. Partial dependency (requiring assistance some of the time) is exhibited by 394,000; while 842,000 are independent.

Causes of Disabilities and Use of Aids

Approximately 6.3 million disabling conditions were reported by 3.0 million disabled adults aged 15 and older, yielding an average of 2.1 conditions per person with a disability.

The most prevalent disabling conditions among Canadian adults are diseases or disorders of the musculoskeletal system and connective tissue, arthritis and rheumatism, and hearing disorders.

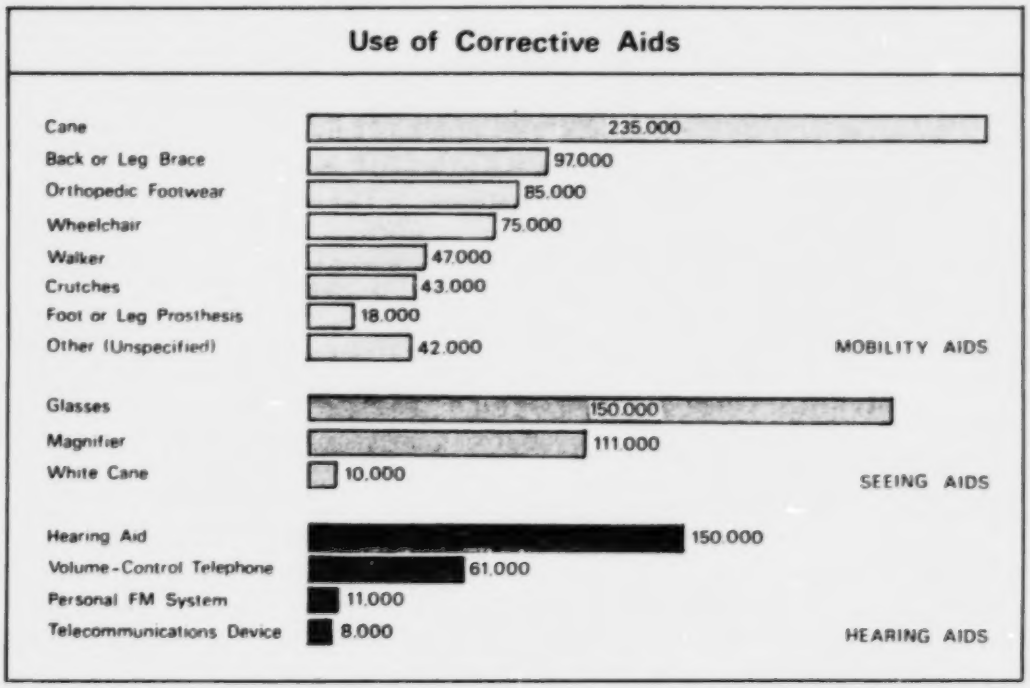


Aging, accidents, disease or illness including stroke are the most common causes mentioned, with aging being the most frequently mentioned for visual and hearing impairments and arthritis. Accidents are the most common cause for 'other musculoskeletal disorders', especially back injuries.

The most common causes of mobility impairment are conditions of the musculoskeletal system and circulatory diseases. The most frequent causes of agility impairment are these same conditions, as well as arthritis and rheumatism. In general, mobility and agility impairments for women are most frequently cited as being due to arthritis or rheumatism, whereas for men these types of disability are due to musculoskeletal disorders.

Speech impairment is most frequently attributed to mental disorders, followed by other nervous system diseases. Sight and hearing disorders are also attributed to diseases of the nervous system and sense organs.

According to the Canadian Health and Disability Survey, the use of aids and prostheses varies widely by province and by rural/urban residence. In Canada, 75.8% of persons with visual disabilities, 28.1% of those with hearing disabilities and 29.2% of those with mobility impairments use aids. Among those reporting a mobility impairment, 274,000 use a cane, 75,000 use a wheelchair, 47,000 use a walker and 43,000 use crutches. In total, 681,000 persons use a mobility aid and 72,000 report that they need an aid. The reason most frequently given for not having mobility aids is cost, cited by 36% of those who need aids.



Eighty-three thousand people with hearing disabilities require hearing aids, and 20,000 with visual disabilities report the need for glasses. Most visually impaired persons use some form of aid: 71% use glasses and 33.5% use a magnifier. Three percent of visually disabled persons (10,000) use a white cane.

Of the individuals reporting difficulty in hearing a conversation, 23.7% (150,000 Canadians) use a hearing aid, 9.6% (61,000) use a volume-control telephone, while smaller numbers use various amplification devices. An estimated 80,000 Canadian adults know how to lip-read; 18,000 can use sign language and 12,000 can finger-spell. Fifty-eight percent of hearing disabled persons (368,000) have difficultly in using a telephone.

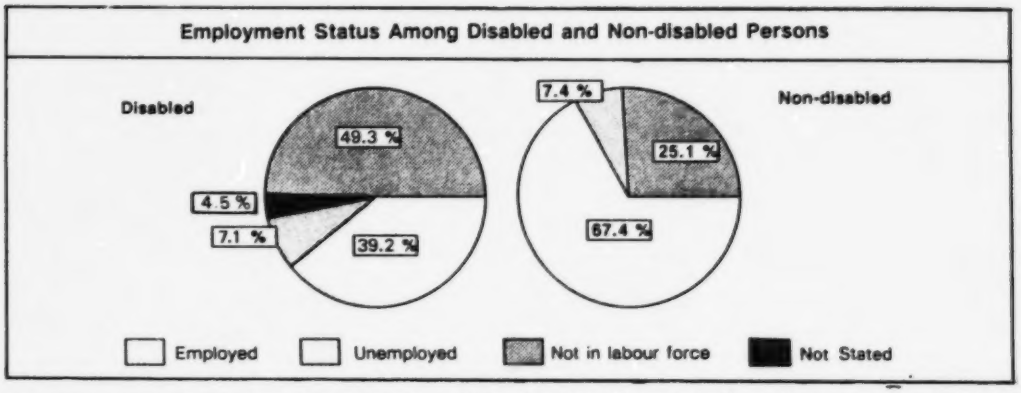
About 243,000 adult Canadians report difficulties with speech, with a very small percentage using corrective aids.

SOCIO-ECONOMIC CHARACTERISTICS

Employment, Education and Income

People with disabilities are less likely to be employed, have lower levels of education and generally lower levels of income.

According to the Health and Activity Limitation Survey, among the 1,817,430 disabled persons aged 15 to 64 living in private households, 39.2% or 711,560 were employed during the time period August to October 1986. In contrast, approximately 70% of non-disabled persons in this age group were employed. Among disabled persons who were employed, more than half (378,875) reported a limitation in the kind or amount of work they could do because of their condition or health problem. There are relatively few differences between the types of occupation held by disabled and non-disabled persons.



There were 895,985 individuals (49.3% of the total) who reported their labour force status as "not in the labour force". Of those who were not in the labour force, 18.6% had never worked, 56.4% indicated that their condition prevented them from working and 11.8% indicated that they were limited in the kind or amount of work they could do.

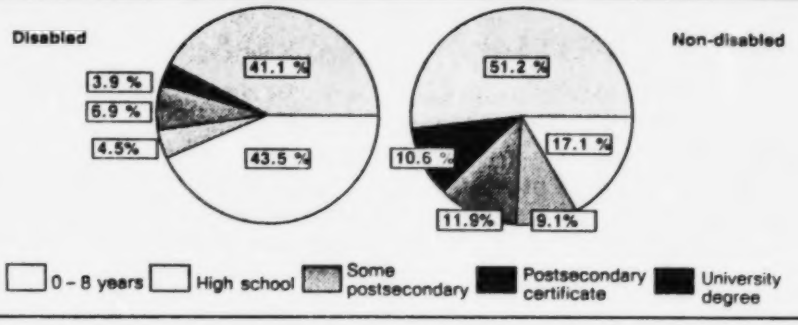
During this same time period of August to October 1986, 128,405 disabled persons reported being unemployed. Of those, 91,890 reported a work-related limitation.

A higher proportion of Canadians reporting a disability have low levels of formal education, compared to the non-disabled population. This holds true across all adult age groups. Of those reporting a disability, 43.5% have only eight or fewer years of schooling, compared to 17.2% of the non-disabled population.

Almost 90 percent of Canadians with a disability who are currently in school have had their education interrupted for long periods of time as a result of their disability.

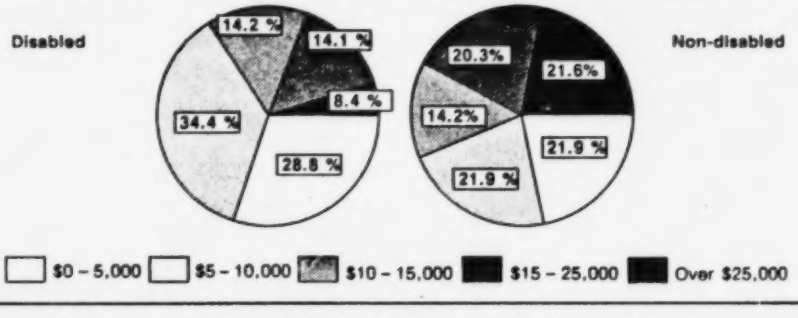
Of the 214,035 disabled children aged 5 to 14 residing in households, 50.6% attended a regular school. An additional 30% attended a regular school with special classes and 6% attended a special school. Only 8%, or 17,450, did not attend school in April 1986.

Education Levels Among Disabled and Non-disabled Persons



Because most disabled persons are not employed, they have lower than average incomes. A comparison of income levels between those reporting a disability and the Canadian population in general indicates that 30.6 percent of income recipients in the total population have incomes of $20,000 or more, compared to 14.5% of those with a disability.

Income Levels Among Disabled and Non-disabled Persons



The level of income for disabled persons tends to decline as the severity of the disability rises, so that only 3.5% of those reporting a major disability have incomes of $20,000 or more.

People with the most severe degrees of disability are those least likely to earn income, and are also more likely to incur additional expenses as a result of their disabilities.

About 68% of Canadians with disabilities own their own homes, compared to 72.1% of the non-disabled population. Disabled persons living in their own homes are more likely to have aids and special features to assist them with mobility in the home than are persons in rental accommodation.

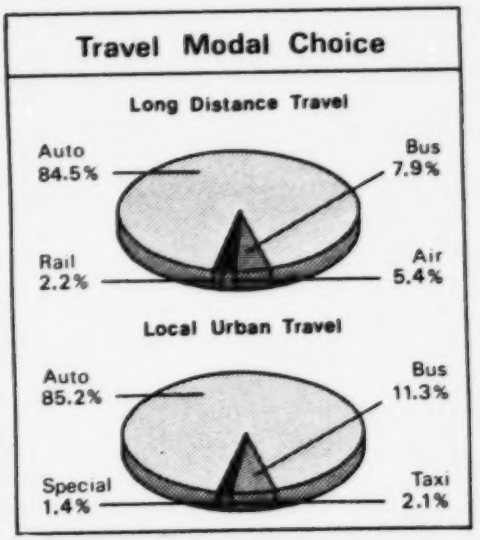
TRAVEL CHARACTERISTICS

How do Disabled Canadians Travel?

Private motor vehicles are available to 72.6% of disabled persons able to leave their homes; 57.9% of those with access to private transport drive themselves. Sixteen thousand people require the addition of some special features on their cars.

An estimated 1,317,000 disabled persons in Canada have access to public transportation: only 59% of those able to leave their homes. Of those who do have access to public transport, 78.6% reported no trouble in using it, leaving an estimated 281,000 (or 21.3%) who do experience difficulties using the public transport that is available.

Some communities have special bus or van service for people who cannot use regular public transport. Of the 142,000 indicating a need for this service, it was available to 80,000 (56.3%) of whom 13,000 use it almost every day, and 29,000 use it occasionally. A taxi service is available to 79.6% of the disabled persons able to leave their home, of whom 13,000 report using it almost every day; a further 405,000 use it occasionally. Considering private and public transport together, less than 1% of those disabled persons who are able to leave their home are without local transportation.



About 85% of all those with a disability report being able to take long-distance trips, almost as many as are able to use local public transport. Cars were used in 84.5% of all long-distance trips by disabled persons; airplanes were used in 5.4% of all trips; and travel was by bus on 7.9% of all occasions. This is very similar to the patterns of choice of non-disabled travellers.

From the Canadian Health and Disability Survey, of the 2,448,000 adult Canadians with a disability, about 2,086,000 report being able to take a long-distance trip (80 km or more). Actual travel experience, however, is limited: 181,000 report having made one or more air trips over a three-month period, 78,000 report some travel by rail and 262,000 by bus.

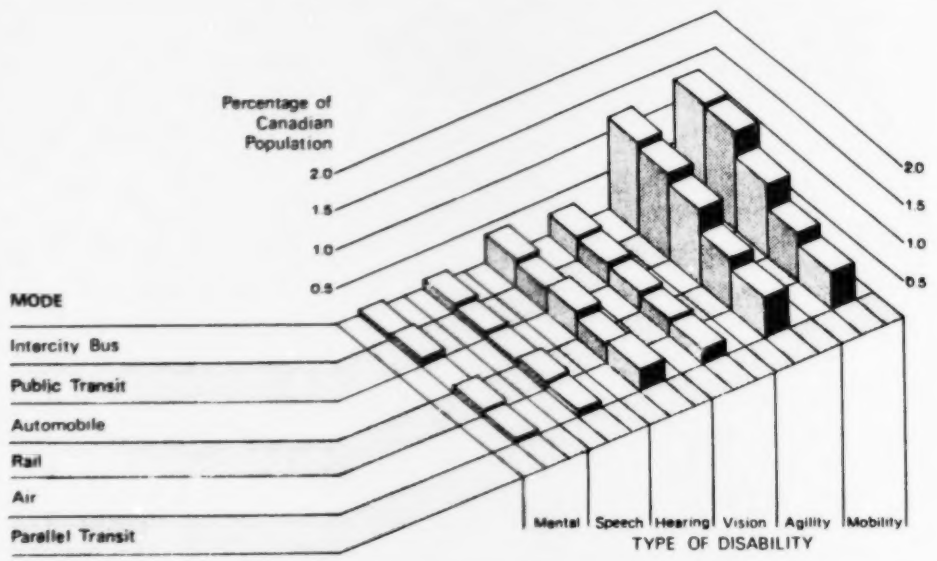
About 300,000 report trouble travelling (depending on the mode of transport); 158,000 are unable to leave their residence because of their condition or health problem; 302,000 cannot take long-distance trips and 121,000 of these reported they cannot travel at all.

Transportation Limitations

According to information from the Canadian Health and Disability Survey, between one and two percent of the Canadian population report trouble travelling -- depending on the mode of transportation.

Trouble travelling by intercity bus was mentioned by 304,000 disabled persons, 281,000 had trouble using local public transport, 154,000 had trouble in rail travel and 136,000 had trouble in air travel.

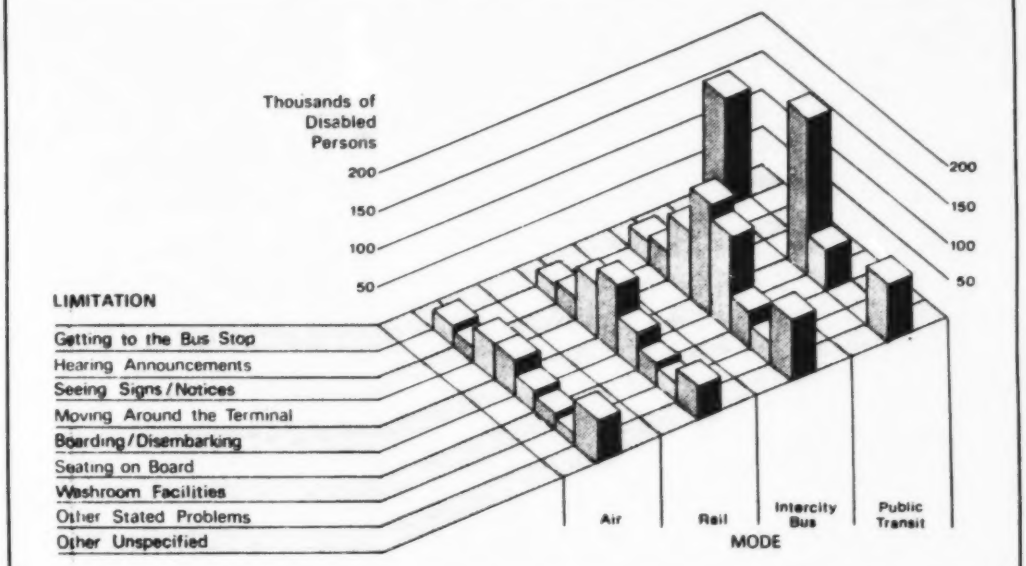
Canadian Population with Transportation Limitations by Mode



Of the 21.3% of the disabled population who had difficulties using local public transportation, the most frequently mentioned concern was getting on or off the bus or streetcar (mentioned by 73% of those experiencing difficulty) or simply getting to the stop (mentioned by 50.5%). Problems with air travel were mentioned by 6.5% of the disabled population; difficulties in travelling by bus were mentioned by 14.6%, and 7.4% mentioned problems in travelling by rail.

Boarding is the main problem in all modes of long-distance transport, but is most common for rail travel. Problems of moving within the terminal were also mentioned more frequently for rail passengers than for other modes of transport. Seating quality on airplanes was mentioned as a problem less frequently than for other forms of transportation, and for all modes of transport difficulties using the washrooms was one of the least frequently mentioned problems.

Types of Transportation Limitations Experienced by Disabled Persons



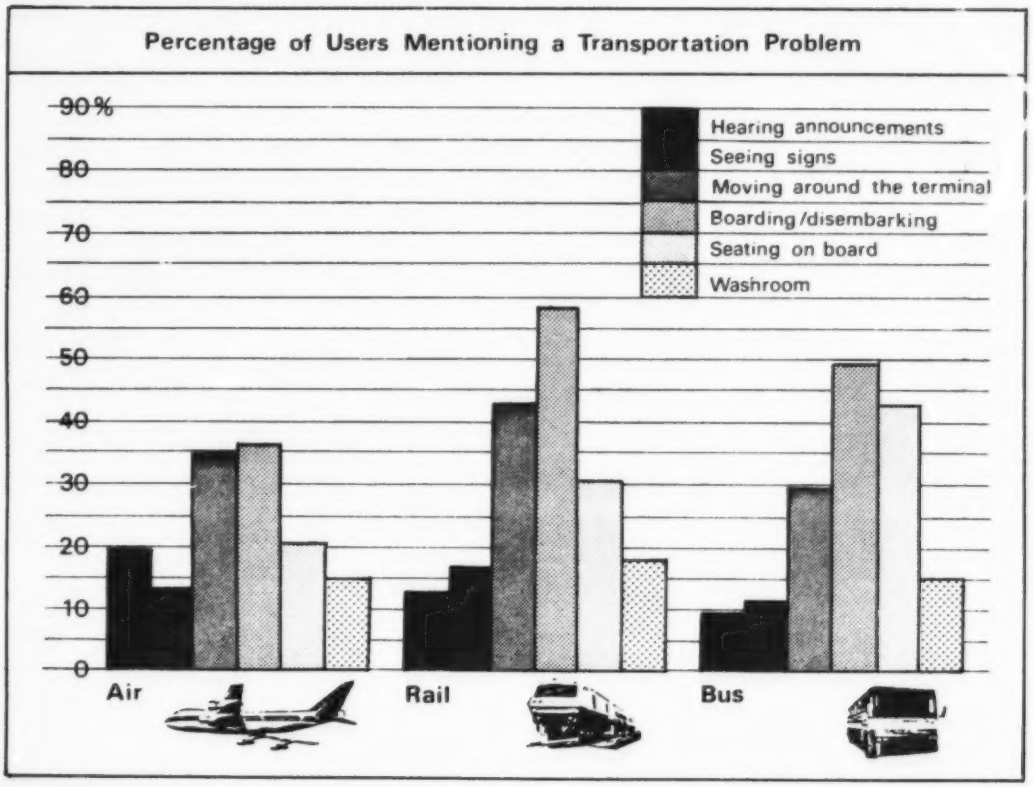
While the nature of the disability for the largest groups of disabled persons who report transportation problems is either mobility or agility related, a significant number of people with sensory disabilities also experience difficulty using transportation services, as shown in the table below.

Canadian Population with Transportation Limitations

	Type of Disability							
	Cognitive	Speech	Hearing	Visual	Agility	Mobility	Unknown	TOTAL
Intercity Bus	13,000 0.07%	19,000 0.10%	70,000 0.37%	55,000 0.29%	219,000 1.14%	259,000 1.35%	10,000 0.05%	304,000 1.58%
Public Transit	16,000 0.08%	18,000 0.09%	57,000 0.30%	52,000 0.27%	209,000 1.09%	250,000 1.31%	7,000 0.04%	281,000 1.47%
Automobile	--	10,000 0.05	53,000 0.28%	39,000 0.20%	172,000 0.90%	187,000 0.98%	14,000 0.07%	245,000 1.28%
Rail	13,000 0.07%	14,000 0.07%	38,000 0.20%	37,000 0.19%	114,000 0.60%	127,000 0.66%	-- --	154,000 0.80%
Air	10,000 0.05%	12,000 0.06%	45,000 0.24%	28,000 0.15%	85,000 0.44%	98,000 0.51%	7,000 0.04%	136,000 0.71%

As seen in the preceding exhibit, depending on the mode of transportation, according to the Canadian Health and Disability Survey, of the 2,448,000 Canadians with a disability, up to 304,000 report trouble travelling. In addition, 302,000 report being unable to take long distance trips and, among these, 121,000 report they cannot travel at all. Thus, approximately 606,000 Canadians are mobility limited.

The reasons for this mobility limitation are many but include such factors as hearing announcements, seeing signs, moving around the terminal and boarding/disembarking. The percentage of users (i.e. those who travel) mentioning a problem by type of transportation is illustrated below.



Trouble hearing announcements was mentioned by 19.1% of the intercity air travellers, 12.3% of the intercity rail and 9.2% of the bus travellers. Trouble seeing signs and notices was mentioned by 13.2% of the air travellers, 16.9% of the rail and 10.9% of the bus travellers. As a rough guide, therefore, it can be seen that 10 to 20 percent of all disabled travellers report trouble with current information systems.

If these percentages could be applied to the numbers of disabled persons in Canada as reported by the Health and Activity Limitation Survey (that is, assuming that all disabled persons would have the same problems as actual users of the transportation systems), the number of individuals having problems with current information systems on intercity transportation would be somewhere between 330,000 to 660,000.

C. INFORMATION SYSTEM COMPONENTS

Every information system consists of several components that must be coordinated in their content, form and media. Content, form and media are the irreducible, basic components of all information:

- The **content** is primarily what is being expressed, directly or obliquely; it is the character of the information, the message. The message is composed with purpose: to tell, express, explain, direct, inspire, affect.
- The **form** is the method of presentation: the design and arrangement of the basic elements of the message.
- The **media** is the location and method of conveyance of the message. It is the interface, the channel of communication between the operator and the user.

Form is affected by content; content is affected by form. The message is cast by the transport operator; received and modified by the traveller.

Information systems may be thought of as having three broad levels of **content** -- varying from quite general information to specific schedule and even current real-time operational information.

The **form** of the information can be abstract, symbolic or literal. Various forms are often combined; for example, abstract and symbolic forms, such as colours and pictograms, may draw travellers attention to more literal forms of information.

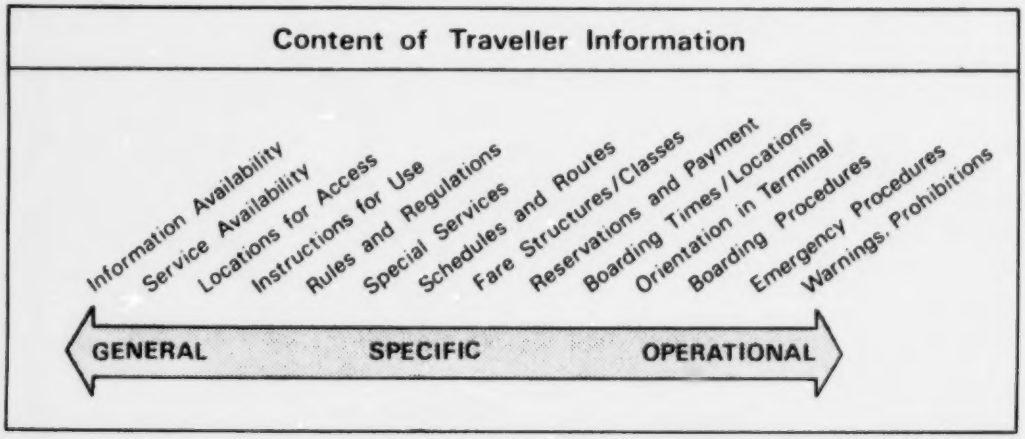
The **media** is differentiated by the level of interaction afforded the traveller -- passive, active or interactive. Print is a passive or static type of media; signs and audio signals may be passive or active; and personal interaction is considered interactive.

Content

In any transportation network, there are several levels of information required by the travellers. The particular level depends on the purpose of the information and tends to dictate its function:

- **general information,** which exists independently of a specific service and refers to transportation in general;
- **specific information,** which concerns a specific service, including its schedule, fare, reservation and payment methods and other conditions;
- **operational information,** which concerns the routing and current timing for an actual trip, including connections and emergency instructions.

The information content does not have to be thought of as only operating in distinct levels, but can be expanded in subtle steps on a continuing basis from one level to the other, ranging from basic service instructions to routing, schedule and fare information to detailed technical instructions for specialized equipment, services and facilities, as shown in the figure below:



General information is provided to increase awareness and to improve attitudes towards the service. This information is oriented towards the occasional traveller with the ultimate purpose of increasing patronage. Information about the service and instructions for obtaining specific or actual information is generally consistent throughout the system and can be treated in a long-range informational or educational manner (6).

Specific information oriented to regular travellers must be provided to ensure that users know where to access the system and how to use it. This information includes detailed information for users that are familiar with the transportation system but need to know route specific details concerning the system such is often contained in timetables and maps.

Operational information is provided to travellers to reduce difficulty in obtaining a ticket and to improve the confidence of users in the service.

The information is oriented towards both the regular and occasional users and can include trip planning or itinerary details. The most important factor with the provision of operational information is that it be provided at the decisive moment for the traveller.

The information content which must be transmitted to all categories of travellers in an easily understandable form includes the following:

- **information availability,** information about availability: where, when and how can the traveller obtain what information?
- **service availability,** directories for locating, which help the user to find the desired network and routings.
- **locations for access,** markings to identify the most important parts of the service, such as the boarding locations.
- **instructions for use,** providing basic information about how to use the system (route, time, price).
- **rules and regulations,** providing general basic information on the regulations covering the service (baggage allowance, no smoking, etc.).
- **special services,** customer service information, containing references to special fares, popular destinations and the like.
- **schedules and routes,** identification of the departure time and estimated duration of the trip (timetable data), as well as the routing, vehicles used on the routes and connections.
- **fare structures/classes,** determination of the fare according to the fare structure as a function of the passenger class, destination, time and duration of the trip.
- **reservations and payment,** purchase and validation of tickets, with information about type and location of ticket sale, methods of payment.
- **boarding times/locations,** identification of the vehicle departure times from specified locations.
- **orientation in terminal,** identification of check-in counters, baggage claim areas, departure gates, and so forth inside the terminal.
- **boarding procedures,** identification of the vehicle departure times from specified locations.
- **emergency procedures,** briefing to inform the travellers of procedures in the event of an emergency situation, explaining the manipulations in the use of technical devices, to be carried out by the travellers themselves.
- **warnings, prohibitions,** protecting the traveller from dangers due to the operation and the operator from misuse of the equipment.

Individual information, as well as the entire information system must be limited to the essential. Too much information is confusing. Lack of information endangers the success of the system. The information provided should guide the travellers through the network as easily as possible. For this reason, information devices must be logically configured for the particular purpose, arranged consistently, and the content and form of the message must be carefully coordinated.

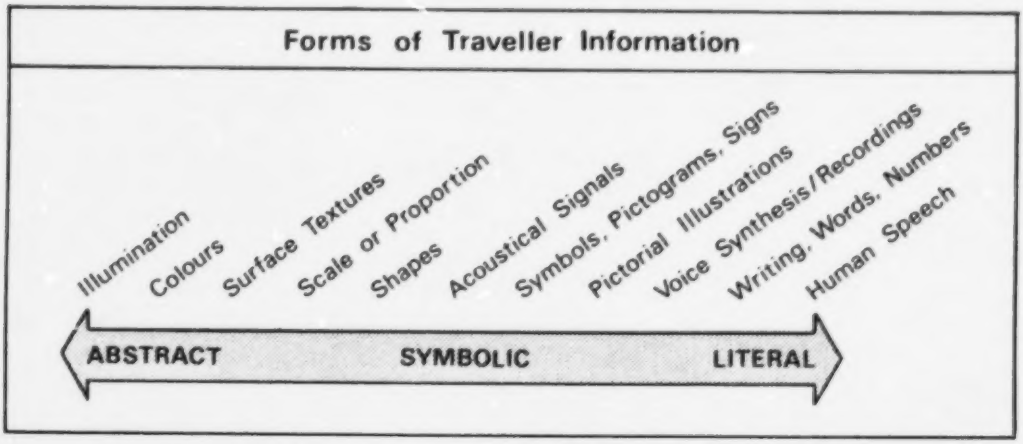
Form

The content of the information (that is, the message) largely dictates the form (the design and arrangement) that the information will take. The provision of warnings, prohibitions or orders will take an entirely different form than instructions for using the service or advertisements to increase ridership.

The forms of information can be thought of as falling within three distinctive and individual levels:

- **abstract forms**, which are the understructure or environmental aspects of the message, the compositional forces that reinforce the information experience;
- **symbolic forms**, which are the representational level of the information, consisting of signs, signals, symbols and pictograms, used to represent specific messages; and
- **literal forms**, which are the informational material requiring no intervening coded systems to facilitate understanding and no decoding to delay comprehension.

The various forms of information and their levels are illustrated in the following figure:



The basic elements of information combine to form a particular message. The elemental forms contained within the message should be intelligible by themselves. For passengers with sensory or cognitive disabilities, abstract forms such as colours and surface textures may be more meaningful than literal forms of information. Easily understandable symbols and pictograms are less demanding with respect to intellectual powers than written information and do not presuppose any knowledge of the language by foreigners. They also may be more meaningful to individuals that are illiterate and certain individuals with cognitive disabilities. Literal forms, on the other hand, are more precise.

The forms that are commonly used to serve transportation information transmission include the following:

- **illumination,** which is often used for important information since it improves the legibility and recognizability of the message. Flashing signs, for example, can be used as attention getters.
- **colours,** the most emotional and expressive element, tend to support the value of information and are often combined with other forms. The colour red, for example, is often used to signify danger.
- **surface textures,** optical or tactile, are the surface characteristic of visual materials, often used for orientation messages, providing particular aid for disabled travellers (especially the visually-impaired).
- **scale or proportion,** the relative size and measurement, which is often used to indicate the relative importance of the message.
- **shapes, dots and lines,** such as circles, squares and triangles, which are often used as markings to identify components of the system, such as the location of departure gates.
- **acoustical signals,** including warning signals such as klaxons, sirens, bells, buzzers and attention signals including triad, gong, buzzer that are used to impart a particular message to the users.
- **symbols, pictograms and signs,** pictures which are evident, easily intelligible and uniform (for example, see figure below).

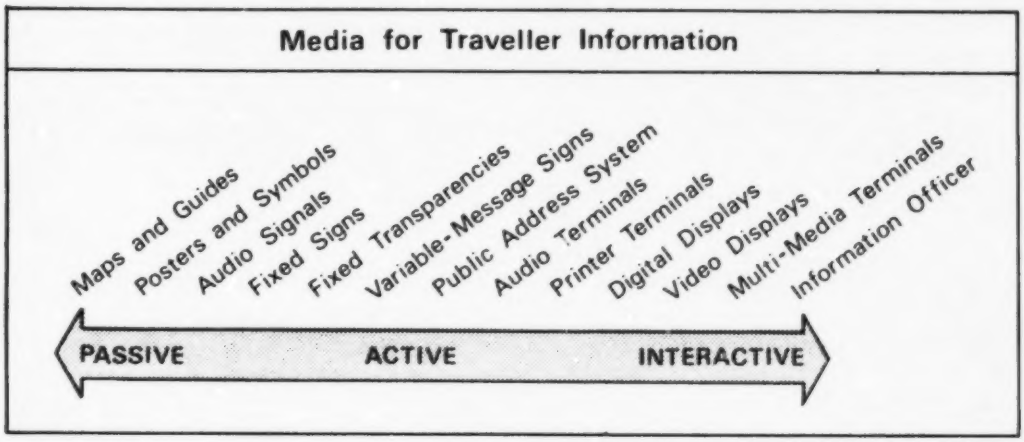
Examples of Symbols and Pictograms

- **pictorial illustrations,** such as photographs, graphs and maps are appropriate to supplement and explain other information.
- **voice synthesis/recordings,** which is often used for repeated information, includes speech storage systems, such as magnetic recording tapes.
- **writing and numbers,** the most precise and most important method of conveying complex information to travellers, often used in **legends** to explain other forms of information in the message.
- **human speech,** which can provide current operational information either in person (providing the traveller with the opportunity to interact and ask questions) or over a loudspeaker.

Media

The provision of information or instructions for travellers can be carried out aurally or visually by humans or various technological devices. Communication of the information can be with or without the possibility for the traveller to interact with questions:

- **passive media,** or static media, in which limited information is conveyed in the same way to all users;
- **active media,** in which specific and changing information is conveyed to users but which can not be questioned by the user;
- **interactive media,** in which the traveller can interrogate and from which they obtain the desired information.



Passive media provides static or open communication with no facility for feedback or interrogation. The information is conveyed in the same way to all users. Active media is a more dynamic, but still open, system that also does not provide any feedback to the information transmitter but allows for broader content. Interactive media is media that is dynamic and closed and provides the user with the opportunity for feedback and interrogation. While the possibility for interaction makes the system more expensive, it allows the traveller to determine whether the information is clear and complete and meets their needs.

The various media for conveying information to travellers can be delineated in subtle steps on a continuing basis through the various levels from passive to interactive as follows:

- **maps and guides,** relating the information content to the geographic area. Containing applicable legends, the maps can be drawn to scale or in a schematic presentation as appropriate.
- **posters and symbols,** providing information or directions in graphic or symbolic form.
- **audio signals,** such as buzzers and alarms, addressing themselves to arousing attention.

- **fixed signs,** which are the most frequently used and least expensive type of information transmission.
- **fixed transparencies,** which are a more expensive form of sign but attract more attention and -- if they are illuminated -- are especially effective during darkness.
- **variable-message signs,** which are often used for frequently changing information. They are indispensable for remote data transmission.
- **public address systems,** serving the amplification, dissemination and remote transmission of the human voice or of acoustical signals.
- **audio terminals,** such as the telephone, providing a means of transmitting human or synthesized voice information remotely.
- **printer terminals,** which can constantly or intermittently transmit current or required information via print-outs.
- **digital displays,** which would consist of a more interactive form of variable-message signs, providing simple listings to the user.
- **video displays,** which can constantly transmit complex information (remotely) via video display units, either actively or interactively.
- **multi-media terminals,** providing for the transmission of written, visual and audio information interactively.
- **information officer,** transportation personnel trained and located to provide information to travellers upon request.

Interaction

In all of its many aspects, providing information for travellers is complex. Nevertheless, complexity need not be a hindrance in understanding the process. True, it is easier to have one set of common definitions, but simplicity has negative aspects. The simpler the formula, the more limited the potential for creative variation and expression. The three-dimensional functionality of information and communication outlined in the previous section -- content, form and media -- offers harmonious interaction, syncretistic though it may be. The striking feature of this typology is its simultaneity. Each dimension is linked to the other and interaction between the dimensions is integral.

But the complexity of providing information to travellers has to be considered in light of the variations involved in its reception. When we perceive a message, we are doing many things at once. We are seeing an enormous field peripherally. We are decoding all manner of symbols. We are imposing on the message our own compositional forces. The reception of information is therefore also a multidimensional process that is influenced and possibly modified by psychological moods and cultural conditioning and by environmental expectations. How we view the world frequently affects what we perceive. The process, is after all, a very individual one for each of us.

D. RESERVATION SIMULATION QUESTIONS

This appendix contains the questionnaire which was used during the travel simulations. The simulated travel scenarios were carried out to assess the qualities of existing travel information systems.

Three travellers from each of the four disability groups (i.e. persons with physical, visual, hearing and learning disabilities) volunteered for this part of the study. Three different travel destinations departing from Vancouver were selected (Comox, Grande Prairie and Chicago) in order to assess the knowledge of the airline reservation agents for different travel scenarios.

A simulation started with a traveller making a phone reservation while a researcher monitored the phone call. The traveller was asked to indicate to the agent their disability and the preferred travel route and times. It was hypothesized that, upon hearing the disability, the reservation agent would initiate a series of questions. If this did not occur, the subject used the list of prepared questions. The questions were believed to be ones which would normally be asked before making a decision as to whether or not to take a particular flight. By listening into the conversation, the researcher could document the information which was passed between agent and traveller for later verification and indication of which questions were initiated by the traveller and which ones by the agent.

To validate the information provided from the reservation and to test other information systems at the airport terminal, the traveller was asked to go out to the airport on the day of departure, to check-in and to proceed to the gate, with or without agent assistance as they would normally. Trained researchers observed the process from a distance to identify any difficulties which the participants might experience.

Simulation Questions

Hello, I want to travel to Comox from Vancouver next _____ at about _____ o'clock. Do you have any flights available? I am in a wheelchair.

	Asked by traveller	Addressed by agent	Answered immediately	Answer delayed	Uncertain	Changed answer
i. I would like to return August _____						
ii. How much will the flight cost?						
CTA 1. Is the flight non-stop?						
SEA 2. Can I make my seat selection now please? I would like an aisle seat bulkhead.						
SEA 3. I am in a wheel chair. Are there lifting armrests in the aisle positions?						
SEA 4. Are the toilets wheelchair accessible? (If agent can't answer ask 4B)						
SEA 4B. What type of aircraft will it be?						
CTA 5. What time do I have to check-in?						
CTA 6. If I drive my car out to the airport, is there designated parking for me?						
AST 8. Can I make arrangements for a staff person to assist me to the gate at the airport in Vancouver?						
EQU9. Will I be able to take my chair on board with me?						
AST10. At what point will I have to leave my chair?						
AST11. How will I get to my seat?						
CTA12. I would like to arrange to have my chair waiting for me at the ramp when I deplane.						
AST13. Can I make arrangements for a staff person to meet the plane in Comox and assist me with my baggage?						
AST14. If an attendant flys with me is there a reduced fare? (IF ANSWERED YES GO TO14B)						
AST 14B Do I need a medical certificate certify that I need an assistant?						
AST15. Do I need medical clearance to fly?						
EQU17. I have a ___ battery. What do I have to know?						
EQU19. If there is any damage to my wheelchair is it covered by the airline?						
EQU20. Can I get the information about this flight in written form please?						

TOTAL TIME _____ # OF INTERUPTIONS _____

Hello, I want to travel to Chicago from Vancouver next _____ at about _____ o'clock. Do you have any flights available?
I am in a wheelchair.

	Asked by traveller	Addressed by agent	Answered immediately	Answer delayed	Uncertain	Changed answer
i. I would like to return August _____.						
ii. How much will the flight cost?						
CTA 1. Is the flight non-stop?						
SEA 2. Can I make my seat selection now please? I would like an aisle bulkhead.						
SEA 3. Are there lifting armrests in the aisle positions?						
SEA 4. Are the toilets wheelchair accessible? (If agent can't answer ask 4B,C)						
SEA 4B. What type of aircraft will it be to _____?						
SEA 4C. What type of aircraft will it be to Chicago?						
CTA 5. Do I have enough time between flights to make my connections?						
CTA 6. Do I have to change terminals?						
CTA 7. How far apart are the gates?						
CTA 8. Can I get my chair out for connection to the next flight?						
CTA 9. What time do I have to check-in?						
CTA10. If I drive my car out to the airport, is there designated parking for me?						
AST11. Can I make arrangements for a staff person to assist me to the gate at the airport in Vancouver?						
EQU12. Will I be able to take my chair on board with me?						
AST13. At what point in boarding will I have to leave my chair?						
AST14. How will I get to my seat?						
CTA15. I would like to arrange to have my chair waiting for me at the ramp when I deplane.						
AST16. Can I make arrangements for a staff person to meet the plane in Chicago and assist me with my baggage?						
AST17. If an attendant flys with me is there a reduced fare? (IF ANSWERED YES GO TO 17B)						
AST 17B Do I need a medical certificate to certify that I need an assistant?						
AST21. Do I need medical clearance to fly?						
EQU22. Do I have a ___ battery. What do I need to know?						
EQU23. If there is any damage to my wheelchair is it covered by the airline?						
EQU24. Can I get the information about this flight in written form please?						

TOTAL TIME _____ # OF INTERUPTIONS _____

Hello, I want to travel to Comox from Vancouver next _____ at about _____ o'clock. Do you have any flights available?
I am hearing impaired.

	Asked by traveller	Addressed by agent	Answered immediately	Answer delayed	Uncertain	Changed answer

i. I would like to return August _____.

ii. How much will the flight cost?

CTA1. Are all the flights non-stop?

SEA2. Can I make my seat selection now?
I would like an exit window seat.

SEA3. What type of aircraft will it be?

CTA4. What time do I have to check-in?

AST5. I am hearing impaired. Can I make arrangements for a staff person to assist me to the gate at the airport in Vancouver?

CTA6. Will there be staff available at both airports who know sign language?

CTA7. Are there TTD terminals available at both airports?

AST8. If an assistant flys with me, is there a reduced fare?
(if yes go to 10B)

AST9. Do I need a medical certificate to prove that I need an assistant?

EQU10. Can I get the information about this flight in written form please?

TOTAL TIME _____ # OF INTERUPTIONS _____

Hello, I want to travel to Chicago from Vancouver next _____ at about _____ o'clock. Do you have any flights available?
I am hearing impaired.

	Asked by traveller	Addressed by agent	Answered immediately	Answer delayed	Uncertain	Changed answer

i. I would like to return August _____.

ii. How much will the flight cost?

CTA1. Are all the flights non-stop?

SEA2. Can I make my seat selection now?
I would like an exit window seat.

SEA3. What type of aircraft will it be to _____?

SEA 3B What type to Chicago?

CTA4. What time do I have to check-in?

AST5. Can I make arrangements for a staff person to assist me to the gate at the airport in Vancouver?

CTA6. Do I have enough time between flights to be able to make my connections?

CTA7 Do I have to change terminals

CTA8. How far apart are the gates?

CTA9. Will there be staff available at both airports who know sign language?

CTA10. Are there TTD terminals available at both airports?

AST11. If an assistant flys with me, is there a reduced fare?
(if yes go to 10B)

AST12. Do I need a medical certificate to prove that I need an assistant?

EQU13. Can I get the information about this flight in written form please?

TOTAL TIME _____ # OF INTERUPTIONS _____

Hello, I want to travel to Comox from Vancouver next _____ at about _____ o'clock. Do you have any flights available?
I am visually impaired.

	Asked by traveller	Addressed by agent	Answered immediately	Answer delayed	Uncertain	Changed answer
i. I would like to return August _____.						
ii. How much will the flight cost?						
CTA1. Is the flight non-stop?						
SEA2. Can I make a seat selection now please? I would like a aisle seat near the exit.						
SEA3. How far are the wahrooms from where I am sitting? (If agent doesn't know go to 3B)						
SEA3B. What type of aircraft will it be?						
CTA4. What time do I have to check-in?						
AST5. Can I make arrangements for a staff person to assist me to the gate at the airport in Vancouver?						
AST6. Can my dog travel with me in the passenger section?						
AST6. Is there any extra cost for my dog?						
EQU8. Do I need a vet certificate for my dog with me?						
AST9. Can I make arrangements for a staff person to meet the plane in Comox and assist me with my baggage?						
CTA10. Can I arrange to have a staff member show me how to get to a taxi in Comox?						
AST11. I might have an attendant with me. Is there a reduced fare for assistants?						
AST12. Do I need medical release to prove that I need an attendant?						
EQU13. My cane doesn't fold up. Will I be able to keep it at my seat?						
EQU14. Can I get my flight information in written form please?						

TOTAL TIME _____ # OF INTERUPTIONS _____

Hello, I want to travel to Chicago from Vancouver next _____ at about _____ o'clock. Do you have any flights available?
I am visually impaired.

	Asked by traveller	Addressed by agent	Answered immediately	Answer delayed	Uncertain	Changed answer
i. I would like to return August _____.						
ii How much will the flight cost?						
CTA1. Is the flight non-stop?						
SEA2. Can I make a seat selection now please? I would like a aisle seat near the exit.						
SEA3. How far are the washrooms from my seat? (If agent doesn't know go to 3B,C)						
SEA3B. What type of aircraft will it be to _____?						
SEA 3C. What type of aircraft will it be to Chicago?						
CTA4. What time do I have to check-in?						
AST5. Can I make arrangements for a staff person to assist me to the gate at the airport in Vancouver?						
AST6. Can my dog travel with me in the passenger section?						
AST7. Is there any extra cost for my dog?						
EQU8. Do I need a vet certificate for my dog with me?						
AST9. Do I have enough time between flights to be able to catch my connections?						
AST10. Do I have to change terminals?						
AST11. Can I make arrangements for a staff person to meet the plane in Chicago and assist me with my baggage?						
CTA12. Can I arrange to have a staff member show me how to get to the ground transportation in Chicago?						
AST13. I might have an attendant with me. Is there a reduced fare for assistants?						
AST14. Do I need a medical relase to prove that I need an attendant?						
EQU15. My cane doesn't fold up. Will I be able to keep it at my seat?						
EQU16. Can I get my ilight information in written form please?						

TOTAL TIME _____ # OF INTERUPTIONS _____

E. ONE TRAVELLER'S EXPERIENCES

This appendix contains some thoughts and experiences of Mr. Lorne Kimber. President. Canadian Association of Disability Communicators, with respect to traveller information systems:

In June 1989. I travelled to Toronto, Ontario with Airline X. The attached tape is a recording of my reservation phone calls (Editor's note: the tape is not attached to this report).

My initial call was to Airline X's 800 convention number on May 26, 1989. I was greeted by a very pleasant reservation clerk, Agent A. The information I was seeking was to:

- o book a return flight from Vancouver to Toronto for my attendant and myself.

  This was accomplished. I was confirmed on Flight #142 on June 20th, 1989.

- o find out the total cost and arrange payment for my attendant and myself,

  I was not clear on this, therefore I called Airline X back, first at the 800 number and was referred to the Vancouver reservation number. This is the second call on the tape. This was accomplished on my third call to Airline X.

- o receive flight times and locator number,

  Leaving Vancouver at 0900 hours, arriving Toronto at 1620 hours. Return was confirmed, leaving Toronto, June 25, 1989 at 1950 hours, arriving Vancouver at 2145 hours. I was given only one locator number TY1068TW, it was on my fourth phone call that I was advised there were two locator numbers. This item was accomplished on my fourth call to Airline X.

- o arrange to utilize my personal wheelchair to and from the door of the aircraft,

  This was accomplished. Agent A said that this would be no problem.

- o arrange seating,

  This was accomplished. Seats 15A & 15B to Toronto, 13A & 13B returning to Vancouver.

- o arrange diet,

  This was accomplished. Agent A would see to it.

My second call was to confirm the price of my attendant fare and the total trip costs, to find out the number for my doctor to call for an attendant authority confirmation, and to confirm flight numbers, I spoke with Agent B and he confirmed that $921.60 was total fare. Could Agent B have advised me there was a separate locator number for my attendant during this call?

Airline X had called me to let me know that my doctor had called and my attendant approved by Airline X.

Call number three to Airline X was made on May 31, 1989 the day before the deadline to pick up the tickets. I was calling to confirm my attendant's fare and the flight. I spoke with Agent C (perhaps because I referred to Agent C by a different name is why I noted a sharp contrast between her and the other Airline X personnel I had dealt with thus far). I was calling to confirm, seeking accurate information about a service I was paying for. Decide for yourself by listening to the tape, was this good service or complicated instructions complete with sighs from Agent C? Could Agent C have advise me there was a separate locator number for my attendant during this call? Of special note is that Agent C provided me with a different total trip cost ($894.10) than Agent B did ($921.16). This can be confusing for anyone.

Due to the difference in cost and the fact that I felt uneasy about the locator number, I called Airline X back. I did not want to speak with Agent C again and didn't. Agent D handled my fourth call. Agent D advised me of a locator number for my attendant, TU0374MJ. Now I could authorize payment for the tickets, knowing both the amount and the two locator numbers. My fourth call to Airline X accomplished my goals of my first call. Why?

After speaking with Agent D, the tickets were picked up by my attendant from a Travel Agent and we arrived at Vancouver International Airport one hour before our flight.

Upon check-in, I handed the tickets to the Ticket Agent and he processed the tickets. I confirmed the seating, meals, wheelchair arrangements, checked our baggage and received our boarding passes. The Agent was

efficient, helpful, and answered each of my questions with dignity. (Note: I encountered an Airline X Ticket Agent on a 1988 trip to Edmonton that changed my pre-designated seats because they were the closest seats to the emergency exit, the door entering the plane. I appreciate the regulation but I had made flights before on the same type of aircraft and was allowed the seating requested. I must plan my flights and my energy. Receiving a change in seating at the last moment also disrupts my designated energy to walk from the door of the aircraft to my seat. Airline X has an adequate aisle wheelchair that I could have requested when the change in seating occurred but for me it not the right time to utilize that service.)

We were directed to a designated holding area for people who use wheelchairs. I chose not to park in the designated area but to go for a roll through the airport to orientate myself to the results of recent construction. We proceeded to security and I was hand-searched and metal detector-searched by a polite, efficient security guard.

We arrived at boarding reception area, checked in efficiently and were directed to the designated holding area for people who use wheelchairs. I chose not to park in the designated area but to go to the smoking area instead.

When pre-boarding was announced we went back to boarding reception and were guided to the door of the aircraft. We were greeted most hospitably. I alighted from my wheelchair, my attendant removed my cushion and we proceeded onto the aircraft.

Assistance was offered, a grab bar pointed out, and I requested the Flight Attendant to walk in front of me, facing me. I explained that I would walk down the aisle, using the seat backs to hold on to. To be prepared if I lost my balance and that I would request an arm if I needed it. The Flight Attendant followed my instructions, assisted me, on request, when we passed the lavatory (there was nothing to hold onto at this particular point).

The Flight Attendant saw that we were comfortably, safely seated in our designated seats. The Flight Attendant helped by placed my cushion in the overhead compartment. The flight was smooth, the service excellent, and the meal was chicken as requested.

We deplaned in Toronto, my wheelchair was intact, waiting at the door of the aircraft. We were promptly escorted to the baggage retrieval area and said good-bye and thank you to our Airline X host.

At 1100 hours on our day of departure, I phoned Airline X from our hotel and confirmed the flight times, my wheelchair requirements, diet and seating. Everything was in order as per arrangements made during my four original reservation phone calls to Airline X.

My attendant and I arrived at the terminal, Pearson Airport, at the designated check-in counter at 1850 hours -- one hour prior to departure (Note: I prefer lowered accessible counters as opposed to a designated check-in which tends to segregate. All check-ins should be constructed accessible to people with disabilities as they are to able-bodied people.)

My attendant handed our tickets to the Ticket Agent. My attendant is an experienced traveller. The Ticket Agent received the tickets and asked my attendant if I wished to use their in-house wheelchair? I remained silent, sitting in my chair, next to my attendant.

The agent asked the same question again, directed to my attendant, I responded, that the information and instructions were in the computer. The agent advised me that there were over 200 people on the flight and she was too busy to check each one.

She repeated her original question and I answered, no, I did not want to use their wheelchair. (Note: This person's attitude towards me was seriously lacking any sensitivity. She was abrupt, rude, inefficient and impolite. When she asked her question, she should have directed it to me and not to my attendant. I was capable of answering. I knew the information was in her computer and was disappointed that she did not care enough about her passengers to find out if there were any special instructions.)

We checked in our luggage, obtained claim checks, and my attendant received our boarding passes. We were directed to the designated area for people who use wheelchairs.

This was a nonsmoking area. I asked another Airline X agent where I could smoke and was advised that there would be time for me to smoke in the boarding reception area. We proceeded to security and I was hand searched and metal detector searched by a polite, efficient security guard.

On the way to the boarding reception area, I checked our seat numbers with my attendant. They were the same as designated.

We proceeded to the boarding reception area without a stop in between. Upon arrival, we stopped at the Gate smoking area, the first pre-boarding call was then given. We had not checked in with the boarding agent yet so we approached her. The agent was given our boarding passes by my attendant. I asked the other agent if I had time for a cigarette. She advised me that either we boarded now or wait and go last, I chose to board last.

My attendant was still at the check-in counter. She had been there too long. When I checked with her she advised me that the agent had taken our boarding passes, set them on the counter and then served another passenger. As I approached the agent, she picked up her phone, I waited,

she answered her phone, made some notes and hung up the phone. She then looked up, with boarding passes in hand, and gave the passes to my attendant.

My attendant and I returned to the smoking section and smoked. We were approached by an Airline X agent, he advised me that he was here to assist me to the plane. I advised him that I would not require assistance. He politely left.

The boarding line was ending so we proceeded to the Gate check in. The agent signalled with her right hand upheld to stop, she said, "Hold it right there!" We stopped.

We were told to wait, we did. At the given time she signalled for us to come now, we did. This agent was curt and abrupt, she checked our boarding passes and we proceeded to the door of the aircraft.

We arrived without incident and at the door, I made eye contact with one of the Flight Attendants, smiled, said hello, and realized immediately that this woman was a people person. I could tell by her smile.

Our boarding passes were checked by another Flight Attendant. I gave her the same instructions on assisting me as I had given in Vancouver, she acknowledged them.

I alighted from my wheelchair, reached up for the handle on the inside of the door, and proceeded to walk towards the aisle. As I rounded the first corner, the Flight Attendant reached out to assist me, I was not falling, but with this new distraction of someone assisting me unrequested.

I stopped to regain my composure and politely thanked her for the assistance but requested that she not physically assist me unless requested or if I am falling. We then proceeded down the aisle of the aircraft to our seats. As we approached the final row of Business Class seats the attendant asked which seats we were going to?

13A and 13B was my response. I had double checked our seats on the way to pre-boarding. She directed us to 13A and 13B, I requested a pillow for sitting on, and after discussion as to why I did not want to use my wheelchair cushion to sit-on, the attendant provided me with the pillow. My attendant placed my cushion in the overhead compartment and we sat down to prepare for take-off.

The Flight Attendant returned and requested to see our boarding passes. She took them and announced, "You are sitting in the wrong seats!" You are supposed to be in seats 8B & 8C in the Business Class section. Now, I knew I had not requested Business Class, nor had I upgraded our tickets to two aisle seats, nor had anyone informed us that our seats had been changed.

It was that phone call that the boarding agent received, the notes she was making were changes on our boarding passes. She made the changes in seating but neglected to tell us what was happening.

The Flight Attendant then started to open the door to the overhead compartment to remove my cushion. By this time the plane was starting to taxi. I advised the Flight Attendant that we would not be changing seats. My energy level told me to stay seated. The attendant advised that we could change seats after take off. I advised here that this would not be necessary.

After take off we were approached by the Flight Attendant that I had had initial eye contact with. She introduced herself as the Flight Attendant Supervisor. Graciously, she invited us to change seats, we agreed.

The Flight Attendant returned and I questioned the forthcoming seating arrangement as she had described earlier. The seats she first spoke of were two adjacent aisle seats. I did not want my attendant to be sitting across from me but beside me.

The response from the attendant was that she had already taken care of that and we would be seated next to each other. Fine for her to know this arrangement but why wasn't this information shared with us?

We changed seats and totally enjoyed the extra effort, service, and comfort given to Business Class passengers. The meal was as requested, except better.

The Flight Attendant Supervisor kept a watchful eye on us and ensured we received the finest in hospitality available in the Business Class section. We were most impressed with her grasp of our situation. She made us feel welcome and comfortable, delivering sensitive, good service.

At the designated time we deplaned in Vancouver, my wheelchair was intact at the door of the aircraft. We were escorted to the baggage area where we said good-bye and thank you to our Airline X host.